## Adult Literacy Fundamental Mathematics: Book 2 2nd Edition

## Adult Literacy Fundamental Mathematics: Book 2 2nd Edition

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BCCAMPUS
VICTORIA, B.C.

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| :--- | :--- | :--- | :--- | :--- | :--- |
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## To the Learner

Welcome to Adult Literacy Fundamental Mathematics: Book 2.
You have the skills you need to be a strong student in this class. Your instructor knows this because you have passed the Adult Literacy Fundamental Mathematics Level 1 class, or you have been assessed into this level.

Adult math learners have many skills. They have a lot of life experience. They also use math in their everyday lives. This means that adult math learners may already know some of what is being taught in this book. Use what you already know with confidence!

## How to Use This Book

This textbook has:

- A Table of Contents listing the units, the major topics, and the subtopics.
- A Grades Record to keep track of your marks.
- Many Exercises to practice what you learned. Some are quite short, but others have a great number of questions. You do not have to do every single question!
- Do as many questions as you feel are necessary for you to be confident in your skill. It is best to do all the word problems.
- If you leave out some questions, try doing every second or every third question. Always do some questions from the end of each exercise because the questions usually get harder at the end. You might use the skipped questions for review before a test.
- If you are working on a difficult skill or concept, do half the exercise one day and finish the exercise the next day. That is a much better way to learn.
- Self-tests at the end of most topics have an "Aim" at the top. If you do not meet the aim, talk to your instructor, find what is causing the trouble, and do some more review before you go on.


## Mark <br> /18 <br> Aim <br> 15/18

- A Review and Extra Practice section is at the end of each unit. If there is an area of the unit that you need extra practice in, you can use this. Or, if you want, you can use the section for more review.
- A Practice Test is available for each unit. You may:
- Write the practice test after you have studied the unit as a practice for the end-ofchapter test, OR
- You might want to write it before you start the unit to find what you already know and which areas you need to work on.
- Unit Tests are written after each unit. Again, you must reach the Aim before you begin the next unit. If you do not reach the aim, the instructor will assist you in finding and practising the difficult areas. When you are ready, you can write a B test to show that you have mastered the skills.
- A Final Test is to be written when you have finished the book. This final test will assess your skills from the whole book. You have mastered the skills in each unit and then kept using many of them throughout the course. The test reviews all those skills.


## Grades Record

You have also been given a sheet to write down your grades. After each test, you can write in the mark. This way you can keep track of your grades as you go through the course. This is a good idea to use in all your courses.

Grade Record - Book 2

| Unit | Practice Test | Date of Test A | Test A | Date of Test B | Test B |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Example |  | September 4, <br> 2020 | $25 / 33$ | September 7, <br> 2020 | $25 / 33$ |
| 1 |  |  |  |  |  |
| 2 |  |  |  |  |  |
| 3 |  |  |  |  |  |
| 4 |  |  |  |  |  |
| 5 |  |  |  |  |  |
| Final Test |  |  |  |  |  |

## How to Deal with Math Anxiety

## Emotions and Learning

Emotions, or what we feel about something, play a big part in how we learn. If we are calm, we learn well. If we are afraid or stressed, we do not learn as well.

Many people are afraid of math. They fear making a mistake. "Math anxiety" is the fear of math. People who suffer from math anxiety may get headaches, sick stomachs, cold hands, or they may just sweat a lot or just feel scared. Math anxiety can happen for a few different reasons:

- Feeling anxious when writing tests
- Negative experiences in a past math class
- Embarrassment in a past math class
- Social pressures and expectations to not like math or not do well in math
- The want to get everything right
- Negative self-message ("I don’t know how to do it," or "I hate math")

Math anxiety is a learned habit. If it is learned, it can be unlearned. Most math anxiety comes from bad memories while learning math. It may be from doing badly on a test or asking a question then being made fun of. These bad memories can make learning math hard.

Everyone can learn math. There is no special talent for math. There are some people who are better at math than others, but even these people had to learn to be good at math.

## Do You Suffer from Math Anxiety?

Read the list below and put a check mark beside the ones you feel when thinking about or doing math.

- Are your palms moist?
- Is your stomach fluttering?
- Do you feel like you can't think clearly?
- Do you feel like you would rather do anything else than learn math?
- Are you breathing faster than normal?
- Is your heart pounding?
- Do you feel cold?
- Do you feel sweaty?

If you answered yes to two or more of these items, you may have math anxiety.
If you have math anxiety, a first step to understanding it is to look at where it all started.
Make a list of your experiences with learning math. Think back to the first math experiences you had and write about them. Think about learning math in school from the younger grades to the higher grades and write about your experiences and feelings. Include this class and how you are feeling right now about learning math.

Beside each experience, write if it was a positive or negative experience.
Look at the examples below to give you an idea:

| Positive <br> or <br> negative? | Math experience |
| :--- | :--- |
| Negative | My teacher in elementary school lined the whole class up in a row and made us play a <br> multiplication game. I could see which question was mine, and I didn't know the answer so I had to <br> figure it out on my fingers before my turn came up. I got the answer right, but I was so nervous that <br> I would be teased because I didn't know the answer off the top of my head. I still don't know my <br> times tables. |
| Positive | In high school, I could use a calculator to figure out the simple multiplication problems, and then I <br> could figure out the tougher problems without worrying about knowing my times tables. |
| Negative | Now that I am upgrading my math, I feel nervous every time I even think about opening the book. I <br> want to get all the answers right, and I know that I won't be able to. I really need everything to be <br> right so that I know that I am getting it. |

Once you have made a list of experiences, go over the stories with your instructor, or by yourself and try to find some common themes.

- Can you see when you felt anxiety?
- Can you see why you are now anxious about math?
- Is there any experience you could use now to help you feel calmer about math?

Hopefully by examining the beginnings of the anxiety, you can feel more in control of it.

## How to Deal with Math Anxiety

Anyone can feel anxiety that will slow down learning. The key to learning is to be the "boss" of your anxiety. Here are an overview of some strategies that may help deal with your anxiety:

- Use breathing exercises
- Think positive math messages
- Know your textbook


## - Understand test-taking anxiety

Remember, learning to deal with your math anxiety may take some time. It took you a long time to learn math anxiety, so it will take some time to overcome it.

## Use Breathing Exercises

One way to be the "boss" is to relax. Try this breathing exercise.

Breathing Exercise

Start by breathing slowly to the count of four. It may help to close your eyes and count.
Now hold your breath for four counts and then let your breath out slowly to the count of four.
The counting is silent and should follow this pattern: "Breath in, two, three, four. Hold, two, three, four. Breath out, two, three, four. Wait, two, three, four."
With practice, the number of counts can be increased. This is an easy and good way to relax.
Now, try this exercise quietly and repeat it five times slowly.

Each time you feel anxious about learning, use the breathing exercise to help calm yourself. Ask yourself if what you tried worked. Do you feel calmer?

## Think Positive Math Messages

Another way to be the "boss" is to give yourself positive math messages.
Read and think about the positive math messages listed below. Do you say any of those things to yourself?

- If the answer is yes, then great, keep doing that.
- If your answer is no, try to add this little mental trick to your day. The result will probably be that you start to see math as something you can do and that you may even like!


## I like math.

## I am good at math.

## I understand math.

## I can relax when I am studying math.

I am capable of learning math.

## Math is my friend.

## My math improves every day.

## I am relaxed, calm and confident when I study math. <br> I understand math when I give myself a chance. <br> Math is creative.

Pick three statements that you like and say them to yourself as much as you can in each day. You can also write the statements out on paper and post them around your house so that you read them throughout the day.

## Know Your Textbook

Look at the Table of Contents in the front of your textbook. It tells you what you will be learning. You may see some things that you already know, some things that you may have forgotten, and some things that are new to you.

Flip the pages. You can see that the textbook is split into units. Each unit is something to learn.
Each unit has exercises to do. Notice the answers are at the end of the exercise. You can check your answers as soon as you are done. You can also check your answer before moving on if are not sure if you are doing the question right.

At the end of each unit is a self-test. It is a chance for you to see how well you have learned the skills in the unit. If you do well, you can move on. If you don't do well, you can go back and practice those skills.

Knowing your textbook gives you a good skill. If you get frustrated, you can use the Table of Contents to go back and find some help.

## Understand Test-Taking Anxiety

There are four reasons people are anxious when writing tests. Any of the four reasons listed below might be the reason a person might feel anxious in a test-taking situation.

1. Not feeling prepared for the test
2. Not sure how to write the test in the best way
3. Feeling too much mental pressure
4. Poor health habits before writing a test

Here is an explanation of each reason and how to work your way out of the anxiety you may feel during tests.

## 1. Not feeling prepared for the test

Many students feel anxiety about taking math tests because they do not feel prepared for the test. To feel prepared, a student needs to have studied the work and know that they can do the problems they will be given. Get help from your classmates, friends, or your instructor to find out how you can improve your study habits.

Getting ready for a test starts on the first day of class. Everything you do in class and at home is part of that getting ready.

- Always do as many exercises as you need to help you understand. Once you understand, do ten more questions, then you will know for sure that you really understand.
- Always correct your exercises. It is good to know that you are understanding and getting the questions right. It is also good to know if you are not understanding and need some help.
- Always do the self-tests. The self-tests can show things that you are not sure of.
- Always do the review. Review is part of this book. It is a chance to go over all the things you have learned in a unit before moving on. It prepares you for what will be on the test.
- Always do a practice test. A practice test gives you a chance to see how many questions and what kind of questions are on the test.


## 2. Not sure how to write the test in the best way

Here are some strategies students should know about how to write a test to do the best as possible on it:

- Before the Test

1. Arrive early. Get out all the supplies you need to do the test (pencils, ruler, calculator, watch, etc.).
2. Be comfortable, but alert. Choose a good spot in the room, and make sure you have enough space to work. Maintain a comfortable posture in your seat, but don't "slouch."
3. Stay relaxed and confident. Keep a good attitude. If you find yourself anxious, take several slow, deep breaths to relax. Don't talk about the test to other students just before entering the room: their anxiety can be contagious.

- During the test.

1. Look over the test. Take a look at the whole test before starting. This takes very little time. Use a highlighter to highlight the questions that you know you can do easily, note key terms, mark the test with comments that come to mind. As you work, put a star beside any questions that you would like to go over again when you finish the test.
2. Relax. Before starting the test, imagine yourself somewhere where you are calm and confident. Go there in your mind. Focus on how good you feel and how in control you are. If you become anxious during the test, in your mind go to the
calming place. Focus on how calm you feel. Then go back to your test.
3. Read the directions carefully. This may be obvious, but it will help you avoid careless errors.

## 4. Answer questions in a strategic order.

- Answer the easy questions first. This will help to build confidence and score points. It may also help you make connections with more difficult questions.
- Then answer the difficult questions. Work on these harder questions with all the energy of the easier ones.

5. Review your answers. Resist the urge to leave as soon as you are done writing. Spend as much time as you can going over your test to see if you:

- Answered all the questions.
- Wrote the answers in right.
- Did not make simple mistakes.


## 3. Feeling too much mental pressure

There are many reasons why a student may feel mental pressure when writing a test. Listed below are a few main reasons:

- Negative beliefs about one's math abilities
- Low self-esteem when it comes to math
- Too high expectations of success
- Fear that failure or low grades will affect the future
- Feelings of pressure of not wanting to let down family members

When students feel this kind of pressure, it is very hard to feel calm and relaxed about a test. The key to success in a math test is to keep the anxiety at a manageable level. You can do this in two ways:

1. Change negative self-talk. Any time a negative thought creeps into your head, it will make it harder to stay positive and relaxed about your test. If you have a negative thought like "I can't do it", try to replace it with a positive thought like "I can do this".
2. Use relaxing and calming techniques. Use the calming breathing mentioned earlier in this section. This will help you keep calm. Also, do not study in the last half hour before the test. You will be calmer by spending time relaxing and breathing deeply in that last half hour.

## 4. Poor health habits before writing a test

When your body and mind are healthy, you will have a better chance of doing well on a test. Eat well, drink plenty of water and get daily exercise. The better you feel, the better you can perform (and a test is a performance!).

## Unit 1: Number Sense

## Topic A：Place Value

## Introduction to Place Values

Each place in a number has a value．

## Ones

The ones place tells how many ones there are．
3 means 3 ones．

ロロロ

9 is the largest amount that we can express（write or say）with one digit．

## Tens

The tens place shows how many tens there are．The ones place must have a digit in it before there can be a digit in the tens place．

Every ten is ten ones．

ロロロロ
ロロロロロ
43 means 4 tens and 3 ones



99 means 9 tens and 9 ones． 99 is the largest amount that we can express（write or say）using only two digits．

## Hundreds

The place to the left of the tens place is the hundreds place. It shows how many hundreds there are. A number written using three whole digits has a hundreds place, a tens place, and a ones place.

Every hundred is ten tens - every hundred is the same as one hundred ones.
Every hundred is ten tens - every hundred is the same as one hundred ones.

$$
\begin{array}{lll}
100 & 100 & 100
\end{array}
$$



425 means 4 hundreds, 2 tens, and 5 ones.



## Thousands

The place to the left of the hundreds place is the thousands place.
One thousand is the same as ten hundreds.


One thousand is the same as one hundred tens.

## 井 井 井



One thousand is the same as one thousand ones．（You will have to imagine the picture of the one thousand ones！）

Thousands Separator：Use a Space

When we write numerals，a little space is left between the thousands place and the hundreds place．The space makes it easier to read large numerals．

$$
4392 \quad 8253 \quad 23693
$$

Large numerals used to be written with a comma（，）instead of a space and you may still see numerals like this：

$$
\begin{array}{lll}
4,392 & 8,253 & 23,693
\end{array}
$$

Learn to use the space instead of a comma because that is the preferred style．

Example A

2212 means 2 thousands， 2 hundreds， 1 ten，and 2 ones


3064 means 3 thousands， 0 hundreds， 6 tens，and 4 ones


What happens if the 0 is not written to hold the hundreds place? The numerals would then be 364 which stands for the number 3 hundreds, 6 tens, and 4 ones.


364 is not the same as 3064 .

## Exercise One

Fill in the blanks to make each sentence true. Draw a sketch if you wish. Check your work using the answer key at the end of the exercise.
a. $8261=$ $\qquad$ thousands $\qquad$ hundreds $\qquad$ tens $\qquad$ ones
b. $4005=$ $\qquad$ thousands $\qquad$ hundreds $\qquad$ tens $\qquad$ ones
c. $2931=$ $\qquad$ thousands $\qquad$ hundreds $\qquad$ tens $\qquad$ ones
d. $1034=$ $\qquad$ thousands $\qquad$ hundreds $\qquad$ tens $\qquad$ ones
e. $2608=$ $\qquad$ thousands $\qquad$ hundreds $\qquad$ tens ___ ones
f. $7543=$ $\qquad$ thousands $\qquad$ hundreds $\qquad$ tens $\qquad$ ones
g. $2900=$ $\qquad$ thousands $\qquad$ hundreds $\qquad$ tens $\qquad$ ones

## Answers to Exercise One

a. 8 thousands 2 hundreds 6 tens 1 ones
b. 4 thousands 0 hundreds 0 tens 5 ones
c. 2 thousands 9 hundreds 3 tens 1 ones
d. 1 thousands 0 hundreds 3 tens 4 ones
e. 2 thousands 6 hundreds 0 tens 8 ones
f. 7 thousands 5 hundreds 4 tens 3 ones
g. 2 thousands 9 hundreds 0 tens 0 ones

## Ten thousands

The place value to the left of thousands is ten thousands. As you can tell by the name, one ten thousand
is ten thousands. You are not going to get a sketch of these large place values because the page isn't big enough!

Example B

43692 = 4 ten thousands, 3 thousands, 6 hundreds, 9 tens, and 2 ones
43692 can also be thought of as 43 thousands, 6 hundreds, 9 tens, and 2 ones.

## Exercise Two

Fill in the blanks. Check your work using the answer key at the end of the exercise.

|  | ten thousands | thousands | hundreds | tens | ones |
| :--- | :--- | :--- | :--- | :--- | :--- |
| 80300 | 8 | 0 | 3 | 0 | 0 |
| OR |  | 80 | 3 | 0 | 0 |

a.

|  | ten thousands | thousands | hundreds | tens | ones |
| :--- | :--- | :--- | :--- | :--- | :--- |
| 36981 |  |  |  |  |  |
| OR |  |  |  |  |  |

b.

|  | ten thousands | thousands | hundreds | tens | ones |
| :--- | :--- | :--- | :--- | :--- | :--- |
| 31205 |  |  |  |  |  |
| OR |  |  |  |  |  |

c.

|  | ten thousands | thousands | hundreds | tens | ones |
| :--- | :--- | :--- | :--- | :--- | :--- |
| 99999 |  |  |  |  |  |
| OR |  |  |  |  |  |

d.

|  | ten thousands | thousands | hundreds | tens | ones |
| :--- | :--- | :--- | :--- | :--- | :--- |
| 15002 |  |  |  |  |  |
| OR |  |  |  |  |  |

e.

|  | ten thousands | thousands | hundreds | tens | ones |
| :--- | :--- | :--- | :--- | :--- | :--- |
| 75125 |  |  |  |  |  |
| OR |  |  |  |  |  |

## Answers to Exercise Two

a.

|  | ten thousands | thousands | hundreds | tens | ones |
| :--- | :--- | :--- | :--- | :--- | :--- |
| 36981 | 3 | 6 | 9 | 8 | 1 |
| OR |  | 36 | 9 | 8 | 1 |

b.

|  | ten thousands | thousands | hundreds | tens | ones |
| :--- | :--- | :--- | :--- | :--- | :--- |
| 31205 | 3 | 1 | 2 | 0 | 5 |
| OR |  | 31 | 2 | 0 | 5 |

c.

|  | ten thousands | thousands | hundreds | tens | ones |
| :--- | :--- | :--- | :--- | :--- | :--- |
| 99999 | 9 | 9 | 9 | 9 | 9 |
| OR |  | 99 | 9 | 9 | 9 |

d.

|  | ten thousands | thousands | hundreds | tens | ones |
| :--- | :--- | :--- | :--- | :--- | :--- |
| 15002 | 1 | 5 | 0 | 0 | 2 |
| OR |  | 15 | 0 | 0 | 2 |

e.

|  | ten thousands | thousands | hundreds | tens | ones |
| :--- | :--- | :--- | :--- | :--- | :--- |
| 75125 | 7 | 5 | 1 | 2 | 5 |
| OR |  | 75 | 1 | 2 | 5 |

## Hundred thousands

Have you heard the expression, "They have a 6 figure salary." That means they earn at least one hundred thousand dollars, which takes six digits to write! The place value to the left of ten thousands is hundred thousands. There is definitely not room on the page for a picture of this place value! Ten ten thousands makes one hundred thousand.

|  | hundred <br> thousands | ten <br> thousands | thousands | hundreds | tens | ones |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 43467 | 4 | 3 | 2 | 4 | 6 | 7 |
| 803214 | 8 | 0 | 3 | 2 | 1 | 4 |

## Millions

And if we look one more place to the left, the place value is millions. One million is 1 with six zeros after it: 1000000.

A space is left between the millions place and the hundred thousands place. A space is left between the thousands place and the hundreds place.

- 2368100
- 14263942
- 3150213
- 5521671


## Place values overview

This place value chart may help you to remember the place values.


Notice the groups of three digits. Look at the pattern for the three places which is repeated in each place value group - the pattern is hundreds, tens, ones.

Our number system is called a decimal system because it is based on the number ten. Deci is a Latin word that means ten. Starting with ones, the place values are each ten times greater.

| ones place $=$ | one |
| :--- | :--- |
| tens place $=$ | 10 ones |
| hundreds place $=$ | 10 tens |
| thousands place $=$ | 10 hundreds |
| ten thousands place $=$ | 10 thousands |
| hundred thousands place $=$ | 10 ten thousands |
| millions place $=$ | 10 hundred thousands |
| ten millions place $=$ | 10 millions |
| hundred millions place $=$ | 10 ten millions |

... and so on.
Our number system is very tidy. When you learn to use the metric measurement system, you will see the metric system is based on ten just like the number system.

## Exercise Three

Write the place value name for each bolded digit. Check your work using the answer key at the end of the exercise.
a. 23206 - the place value for " 3 " is thousands
g. 48076 - the place value for " 4 "
b. 2468 - the place value for " 6 " is tens
h. 5555 - the place value for the second " 5 "
c. 622 - the place value for " 6 "
i. 12245 - the place value for " 5 "
d. 92002 - the place value for " 9 "
j. 92002 - the place value for the second " 0 "
e. 92002 - the place value for the first " 0 "
k. 12026 - the place value for the first " 2 "
f. 14262 - the place value for " 6 "
l. 6348 - the place value for " 6 "

## Answers to Exercise Three

a. thousands
g. ten thousands
b. tens
h. hundreds
c. hundreds
i. ones
d. ten thousands
j. tens
e. hundreds
k. thousands
f. tens
l. thousands

## Exercise Four

Identify the digit for the place value named. Check your work using the answer key at the end of the exercise.
a. thousands 416245
g. hundreds 74322
b. tens 363482
h. hundred thousands 685413
c. ten thousands 36482
i. thousands 221300
d. hundreds 1456
j. ten thousands 10000
e. hundred thousands 206415
k. ones 16394
f. thousands 63421
l. tens 684

## Answers to Exercise Four

a. $416245-6$
g. $74 \underline{322-3}$
b. $3634 \underline{8} 2-8$
h. $685413-6$
c. $36482-3$
i. $221300-1$
d. 1456-4
j. $10000-1$
e. $206415-2$
k. 16 394-4
f. $63421-3$
l. $6 \underline{8} 4-8$

## Reading and Writing Numerals

You know that the digits are 0123456789 and that digits are arranged in different places so we can count larger amounts than our ten fingers!

When we use digits, we call what we write the "numeral."

- 328 is a numeral
- 46 is a numeral
- 3 is a numeral

We use numerals to represent numbers.

## Numerals under 1000

The numerals from 1 to 12 have special words. These are

| 0 | zero | 2 |
| :--- | :---: | :--- |
| 1 | two |  |
| 1 | 3 | three |

12 Unit 1: Number Sense
4 four
5 five
6 six
7 seven
9 nine
8 eight

The numerals from 13 to 19 are
13 thirteen
14 fourteen
15 fifteen
16 sixteen
17 seventeen
18 eighteen
19 nineteen
The word names for the numbers 20 to 90 are
20 twenty
30 thirty
40 forty
50 fifty
60 sixty
70 seventy
80 eighty
90 ninety
The names for the numbers between groups of tens also follow a pattern. The first number tells us how many tens. The second number tells us how many ones.

| Number | Tens Ones |
| :--- | :--- |
| 20 | twenty |
| 21 | twenty-one |
| 22 | twenty-two |
| 23 | twenty-three |
| 24 | twenty-four |
| 25 | twenty-five |
| 26 | twenty-six |
| 27 | twenty-seven |
| 28 | twenty-eight |
| 29 | twenty-nine |

30s

| Number | Tens Ones |
| :--- | :--- |
| 30 | thirty |
| 31 | thirty-one |
| 32 | thirty-two |
| 33 | thirty-three |
| 34 | thirty-four |
| 35 | thirty-five |
| 36 | thirty-seven |
| 37 | thirty-eight |
| 38 | thirty-nine |
| 39 |  |


| Number |  |
| :--- | :--- |
| 40 | Tens Ones |
| 41 | forty |
| 42 | forty-one |
| 43 | forty-two |
| 44 | forty-three |
| 45 | forty-four |
| 46 | forty-five |
| 47 | forty-six |
| 48 | forty-eight |
| 49 | forty-nine |

The written names for numbers that have tens and ones are written with a hyphen (-) between them. This pattern with the hyphen continues up to ninety-nine (99).

When we write hundreds in words, we need two words. The first word tells us how many hundreds. The second word tells us we are counting hundreds.

## 200 <br> two hundred

You now know how to write numbers in words up to 999.

## Example C

| $\mathbf{3 6 7}$ is made of | $\mathbf{3}$ hundreds | $\mathbf{6}$ tens | $\mathbf{7}$ ones |
| :--- | :--- | :--- | :--- |
| Each part is written: | three hundreds | sixty | seven |
| Put the parts together: | three hundred sixty-seven |  |  |

Remember:

- hyphen (-) between the tens and units no hyphen anywhere else
- no "s" on the hundred
- no "and" between the hundreds place and the tens place

Here is another example. Watch out for the empty space!

Example D
5054 is made of $\mathbf{5}$ hundreds $\mathbf{0}$ tens $\mathbf{4}$ ones

Each part is written: five hundreds 4
Put the parts together: five hundred four

Here is another example. Watch out for the empty space!

Example E
$\mathbf{8 9 0}$ is made of $\quad \mathbf{9}$ hundreds $\quad \mathbf{9}$ tens $\mathbf{0}$ ones
Each part is written:
eight hundreds
Put the parts together: eight hundred ninety

Here is another example. Watch out for the empty spaces!

Example F
$\mathbf{1 0 0}$ is made of $\mathbf{1}$ hundreds $\mathbf{0}$ tens $\mathbf{0}$ ones
Each part is written: one hundred
Put the parts together: one hundred

Remember: empty spaces are not written in words.

## Numerals over 1000

Large numerals are read in the place value groups of three that you noticed in the place value chart. You have been practicing reading numerals with three digits or less. Now practice reading the thousands group.

## Example G

423796 is made of

|  | hundred <br> thousands | ten thousands | thousands | hundreds | tens | ones |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Numeral <br> digits | 4 | 2 | 3 | 7 | 9 | 6 |
| Numeral <br> words | four hundred | twenty | three <br> thousand | seven hundred | ninety | six |

Each is written:

- The thousands group is written: four hundred twenty-three thousand.
- The hundreds, tens, and ones are written: seven hundred ninety six.

Put the parts together: 423796 is four hundred twenty-three thousand seven hundred ninety-six.

|  | hundred <br> thousands | ten <br> thousands | thousands | hundreds | tens |
| :--- | :--- | :--- | :--- | :--- | :--- | ones | 26201 is <br> made of |  |
| :--- | :--- |
| Each is <br> written | twenty-six thousand |
| Put the parts <br> together | twenty-six thousand two hundred one |

26201 is twenty-six thousand two hundred one.

|  | hundred <br> thousands | ten <br> thousands | thousands | hundreds | tens |
| :--- | :--- | :--- | :--- | :--- | :--- |
| 400000 is <br> made of | 4 | 0 | 0 | 0 | 0 |
| Each is <br> written | four hundred thousand |  |  |  |  |
| Put the parts <br> together | four hundred thousand |  |  |  |  |

400000 is four hundred thousand.

Write the word names for the numerals. Check your work using the answer key at the end of the exercise.
a. 491200

|  | hundred <br> thousands | ten <br> thousands | thousands | hundreds | tens | ones |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Numeral <br> digits |  |  |  |  |  |  |
| Numeral <br> words |  |  |  |  |  |  |

a. Each is written:
a. Thousands:
b. Hundreds, tens, ones:
b. Put the parts together:
b.

|  | hundred <br> thousands | ten <br> thousands | thousands | hundreds | tens | ones |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 19631 is <br> made of |  |  |  |  |  |  |
| Each is <br> written |  |  |  |  |  |  |
| Put the parts <br> together |  |  |  |  |  |  |

c.

|  | hundred <br> thousands | ten <br> thousands | thousands | hundreds | tens | ones |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 623009 is <br> made of |  |  |  |  |  |  |
| Each is <br> written |  |  |  |  |  |  |
| Put the parts <br> together |  |  |  |  |  |  |

d. 923471 $\qquad$
e. 53679 $\qquad$

## Answers to Exercise Five

a. 491200

|  | hundred <br> thousands | ten <br> thousands | thousands | hundreds | tens | ones |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Numeral <br> digits | 4 | 9 | 1 | 2 | 0 | 0 |
| Numeral <br> words | four hundred | nintey | one <br> thousand | two hundred |  |  |

a. Each is written:
a. Thousands: Four hundred ninety-one thousand
b. Hundreds, tens, ones: Two hundred
b. Put the parts together: Four hundred ninety-one thousand two hundred
b.

|  | hundred <br> thousands | ten <br> thousands | thousands | hundreds | tens | ones |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 19631 is <br> made of |  | 1 | 9 | 6 | 3 | 1 |
| Each is <br> written | nineteen thousand | six hundred | thirty | one |  |  |
| Put the parts <br> together | nineteen thousand six hundred thirty-one |  |  |  |  |  |

c.

|  | hundred <br> thousands | ten <br> thousands | thousands | hundreds | tens | ones |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 623009 is <br> made of | 6 | 2 | 3 | 0 | 0 | 9 |
| Each is <br> written | six hundred twenty-three thousand |  | nine |  |  |  |
| Put the parts <br> together | six hundred twenty-three thousand nine |  |  |  |  |  |

d. nine hundred twenty-three thousand four hundred seventy-one
e. fifty-three thousand six hundred seventy-nine

Now, just for fun, take a look at these very large numerals. Say -million for the group to the left of the thousands group.

|  | millions | hundred <br> thousands | ten <br> thousands | thousands | hundreds | tens | ones |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 2643182 <br> is made of | 2 | 6 | 4 | 3 | 1 | 8 | 2 |
| Each is <br> written | two million | six hundred forty-three thousand | one <br> hundred | eighty | two |  |  |
| Put the <br> parts <br> together | two million six hundred forty-three thousand one hundred eighty-two |  |  |  |  |  |  |


|  | millions | hundred <br> thousands | ten <br> thousands | thousands | hundreds | tens | ones |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 6510231 <br> is made of | 6 | 5 | 1 | 0 | 2 | 3 | 1 |
| Each is <br> written | six million | five hundred ten thousand | two <br> hundred | thirty | one |  |  |
| Put the <br> parts <br> together | six million five hundred ten thousand two hundred thirty-one |  |  |  |  |  |  |

Exercise Six

Write the word names for the numerals. Check your work using the answer key at the end of the exercise.
a.

|  | millions | hundred <br> thousands | ten <br> thousands | thousands | hundreds | tens |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | ones |  |  |
| :--- | :--- |
| 2851234 <br> is made of |  |
|  |  |
|  |  |

b.

|  | millions | hundred <br> thousands | ten <br> thousands | thousands | hundreds | tens | ones |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 3186662 <br> is made of |  |  |  |  |  |  |  |
| Each is <br> written |  |  |  |  |  |  |  |
| Put the <br> parts <br> together |  |  |  |  |  |  |  |

c. 3916875 $\qquad$
d. 4873519 $\qquad$

## Answers to Exercise Six

a.

|  | millions | hundred <br> thousands | ten <br> thousands | thousands | hundreds | tens | ones |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 2851234 <br> is made of | 2 | 8 | 5 | 1 | 2 | 3 | 4 |
| Each is <br> written | two <br> million | eight hundred fifty-one thousand | two <br> hundred | thirty | four |  |  |
| Put the <br> parts <br> together | two million eight hundred fifty-one thousand two hundred thirty-four |  |  |  |  |  |  |

b.

|  | millions | hundred <br> thousands | ten <br> thousands | thousands | hundreds | tens | ones |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 3186662 <br> is made of | 3 | 1 | 8 | 6 | 6 | 6 | 2 |
| Each is <br> written | three <br> million | one hundred eighty-six thousand | six <br> hundred | sixty | two |  |  |
| Put the <br> parts <br> together | three million one hundred eighty-six thousand six hundred sixty-two |  |  |  |  |  |  |

c. three million nine hundred sixteen thousand eight hundred seventy-five
d. four million eight hundred seventy-three thousand five hundred nineteen

Work on reading these numerals with someone else and then ask your instructor to listen as you read them.

- 27800
- 2345409
- 164231
- 260164342
- 138000
- 410623
- 912050
- 24900
- 227695
- 105576


## Exercise Seven

Now practice writing numerals from number names. Check your work using the answer key at the end of the exercise.
a. Eight hundred twenty-three thousand nine hundred forty-one

|  | eight hundred twenty-three thousand |  |  | nine hundred forty-one |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| millions | hundred <br> thousands | ten <br> thousands | thousands | hundreds | tens | ones |
|  | 8 | 2 | 3 | 9 | 4 | 1 |
| 823941 |  |  |  |  |  |  |

b. Three million four hundred eighty-one thousand five hundred sixty-seven

| three <br> million | four hundred eighty-one thousand |  | five hundred sixty- seven |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| millions | hundred <br> thousands | ten <br> thousands | thousands | hundreds | tens | ones |
| 3 | 4 | 8 | 1 | 5 | 6 | 7 |
| 3481567 |  |  |  |  |  |  |

c. Two hundred seventy-six thousand five hundred eight

|  |  |  |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :---: |
| millions | hundred <br> thousands | ten <br> thousands | thousands | hundreds | tens | ones |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |

d. One million six hundred fifty-eight thousand three hundred twenty-five

|  |  |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| millions | hundred <br> thousands | ten <br> thousands | thousands | hundreds | tens | ones |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

e. Four million eight hundred sixteen thousand two hundred thirty-two

|  |  |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| millions | hundred <br> thousands | ten <br> thousands | thousands | hundreds | tens | ones |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

f. Two hundred seventy-nine thousand two hundred sixty-one

|  |  |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| millions | hundred <br> thousands | ten <br> thousands | thousands | hundreds | tens | ones |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

## Answers to Exercise Seven

c. Two hundred seventy-six thousand five hundred eight

|  | two hundred seventy-six thousand |  | five hundred eight |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| millions | hundred <br> thousands | ten <br> thousands | thousands | hundreds | tens | ones |
|  | 2 | 7 | 6 | 5 | 0 | 8 |
| 276508 |  |  |  |  |  |  |

d. One million six hundred fifty-eight thousand three hundred twenty-five

| one million | six hundred fifty-eight thousand |  |  | three hundred twenty-five |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| millions | hundred <br> thousands | ten <br> thousands | thousands | hundreds | tens | ones |
| 1 | 6 | 5 | 8 | 3 | 2 | 5 |
| 1658325 |  |  |  |  |  |  |

e. Four million eight hundred sixteen thousand two hundred thirty-two

| four million | eight hundred sixteen thousand |  | two hundred thirty-two |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| millions | hundred <br> thousands | ten <br> thousands | thousands | hundreds | tens | ones |
| 4 | 8 | 1 | 6 | 2 | 3 | 2 |
| 4816232 |  |  |  |  |  |  |

f. Two hundred seventy-nine thousand two hundred sixty-one

|  | two hundred seventy-nine thousand |  | two hundred sixty-one |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| millions | hundred <br> thousands | ten <br> thousands | thousands | hundreds | tens | ones |
|  | 2 | 7 | 9 | 2 | 6 | 1 |
| 279261 |  |  |  |  |  |  |

## Exercise Eight

Write the number in each of the word problems. Check your work using the answer key at the end of the exercise.
a. The Nile River in Africa is the longest river in the world. It is two thousand five hundred sixtynine kilometers.
b. Canada shares a border with the United States that is eight thousand eight hundred ninety-three kilometers.
c. The distance around the Earth is forty thousand seventy-six kilometers.
d. The population of British Columbia in 2009 was four million four hundred fifty-five thousand two hundred seven.

## Answers for Exercise Eight

a. 2569 kilometers
b. 8893 kilometers
c. 40076 kilometers
d. 4455207 people

## Topic A: Self-Test

## Mark / 17 Aim 14/17

A. Write the place value for the underlined digit. (6 marks)
a. $87 \underline{6} 5$ the place value of 6
b. $93 \underline{0}$ the place value of 0
c. 47932 the place value of 4
d. $8 \underline{5} 421$ the place value of 5
e. 279673 the place value of 2
f. 397 the place value of 3
B. Write the numerals for these word names. (5 marks)
a. eight hundred forty-seven
b. four thousand three hundred eighty
c. two hundred seventy-five thousand eighty-seven
d. sixty thousand four hundred sixteen
e. fifteen thousand twenty
C. Write the numerals for these word names. (5 marks)
a. eight hundred forty-seven
b. four thousand three hundred eighty
c. two hundred seventy-five thousand eighty-seven
d. sixty thousand four hundred sixteen
e. fifteen thousand twenty

## Answers to Topic A Self-Test

A.
a. tens
d. thousands
b. ones
e. hundred thousands
c. ten thousands
f. hundreds
B.
a. fifty-nine
b. nine hundred forty-two
c. seven thousand three hundred seventy-eight
d. eight thousand two hundred
e. four thousand five
f. fifty-eight thousand three hundred ten
C.
a. 847
b. 4380
c. 275087
d. 60416
e. 15020

## Topic B: Expanded Form

When we write a number in expanded form, each digit is written with its place value.
Example:

|  | millions | hundred <br> thousands | ten <br> thousands | thousands | hundreds | tens | ones |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 598 is <br> made of |  |  |  |  | 5 | 9 | 8 |
| Each is <br> written |  |  | 500 | 90 | 8 |  |  |
| Expanded <br> form | $500+90+8$ |  |  |  |  |  |  |

Example:

|  | millions | hundred <br> thousands | ten <br> thousands | thousands | hundreds | tens | ones |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 1068 is <br> made of |  |  |  | 1 | 0 | 6 | 8 |
| Each is <br> written |  |  |  | 1000 |  | 60 | 8 |
| Expanded <br> form |  |  |  |  |  |  |  |

## Example:

|  | millions | hundred <br> thousands | ten <br> thousands | thousands | hundreds | tens | ones |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 243690 is <br> made of |  | 2 | 4 | 3 | 6 | 9 | 0 |
| Each is <br> written |  | 200000 | 40000 | 3000 | 600 | 90 | 0 |
| Expanded <br> form | $200000+40000+3000+600+90$ |  |  |  |  |  |  |

a. 329

|  | millions | hundred <br> thousands | ten <br> thousands | thousands | hundreds | tens | ones |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 329 is <br> made of |  |  |  |  | 3 | 2 | 9 |
| Each is <br> written |  |  |  | 300 | 20 | 9 |  |
| Expanded <br> form |  |  |  |  |  |  |  |

b. 762

|  | millions | hundred <br> thousands | ten <br> thousands | thousands | hundreds | tens | ones |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| is made of |  |  |  |  |  |  |  |
| Each is <br> written |  |  |  |  |  |  |  |
| Expanded <br> form |  |  |  |  |  |  |  |

c. 1847

|  | millions | hundred <br> thousands | ten <br> thousands | thousands | hundreds | tens | ones |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| is made of |  |  |  |  |  |  |  |
| Each is <br> written |  |  |  |  |  |  |  |
| Expanded <br> form |  |  |  |  |  |  |  |

d. 6301

|  | millions | hundred <br> thousands | ten <br> thousands | thousands | hundreds | tens | ones |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| is made of |  |  |  |  |  |  |  |
| Each is <br> written |  |  |  |  |  |  |  |
| Expanded <br> form |  |  |  |  |  |  |  |

e. 16492

|  | millions | hundred <br> thousands | ten <br> thousands | thousands | hundreds | tens | ones |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| is made of |  |  |  |  |  |  |  |
| Each is <br> written |  |  |  |  |  |  |  |
| Expanded <br> form |  |  |  |  |  |  |  |

f. 74296

|  | millions | hundred <br> thousands | ten <br> thousands | thousands | hundreds | tens | ones |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| is made of |  |  |  |  |  |  |  |
| Each is <br> written |  |  |  |  |  |  |  |
| Expanded <br> form |  |  |  |  |  |  |  |

## Answers to Exercise One

a. $300+20+9$
b. $700+60+2$
c. $1000+800+40+7$
d. $6000+300+1$
e. $10000+6000+400+90+2$
f. $70000+4000+200+90+6$

## Exercise Two

Write each number from expanded form. Check your work using the answer key at the end of the exercise.
Example: $600+30+7=637$
Example: $7000+500+40+1=7541$
Example: $4000000+600000+70000+8000+900+3=\mathbf{4 6 7 8 9 0 3}$
a. $400+10+6=$
b. $500+40+2=$
c. $5000+600+10+8=$
d. $4000+100+40+5=$
e. $20000+1000+800+10+2=$
f. $40000+200+5=$
g. $30000+4000+50+3=$
h. $200000+50000+3000+400+80+3=$
i. $300000+50000+6000+700+10+9=$
j. $1000000+400000+20000+3000+600+50+7=$

## Answers to Exercise Two

a. 416
b. 542
c. 5618
d. 4145
e. 21812
f. 40205
g. 34053
h. 253483
i. 356719
j. 1423657

## Topic B: Self-Test

## Mark / 12 Aim 10/12

A. Write each number in expanded form. (6 marks.)
a. 643
b. 759
c. 4821
d. 94205
e. 367542
f. 1850643
B. Write each number from its expanded form. (6 marks.)
a. $300+60+9=$
b. $700+5=$
c. $1000+400+90+1=$
d. $20000+1000+500+80+4=$
e. $500000+40000+2000+700+30+9=$
f. $3000000+900000+60000+8000+400+30+1=$

## Answers to Topic B Self-Test

A.
a. $600+40+3$
b. $700+50+9$
b. 705
c. $4000+800+20+1$
c. 1491
d. $90000+4000+200+5$
e. $300000+60000+7000+500+40+2$
f. $1000000+800000+50000+600+40+3$
B.
a. 369
d. 21584
e. 542739
f. 3968431

## Topic C: Ordering Numerals

In this topic you will learn to arrange numerals in order from smallest to largest. Sorting numbered papers such as order forms, arranging items by the date and comparing prices are examples of the ways you use this skill. First look at pairs of numerals. Look at two numerals and tell which one is larger. How do you do this?

## Exercise One

Identify the larger number in each pair.
a. 431; (484-484 is larger
b. $267 ; 251$
c. $684 ; 693$
d. 274; 315
e. 932; 895
f. 792; 810

## Answers to Exercise One

b. 267
c. 693
d. 315
e. 932
f. 810

To compare numerals, look at the place with the largest value.

Example A: Compare 1628 and 1599.

- thousands are the same.
- hundreds
- 1628 has 6 hundreds.
- 1599 has 5 hundreds.
- 1628 is larger than 1599 .


## Example B: Compare 13562 and 13612

- ten thousands are the same thousands are the same
- hundreds
- 13562 has 5 hundreds
- 13612 has 6 hundreds
- 13612 is larger than 13562 .


## Example C: Compare 673234 and 673423

- hundred thousands are the same
- ten thousands are the same
- thousands are the same
- hundreds
- 673234 has 2 hundreds
- 673423 has 4 hundreds

Note: Numerals with one digit are always less than numerals with two digits. Numerals with two digits are always less than numerals with three digits, and so on.

- 9 is less than 15
- 87 is less than 107
- 999 is less than 1001


## Exercise Two

Draw a box around the larger numeral in each pair. Check your work using the answer key at the end of the exercise.
a. 1016; 1316
f. $31276 ; 31576$
b. $1229 ; 1329$
g. $46821 ; 46801$
c. $5230 ; 5210$
h. $343 ; 3740$
d. 2 151; 2159
i. $8325 ; 8236$
e. 83 476; 93475

## Answers to Exercise Two

b. 1329
c. 5280
d. 2159
e. 93476
f. 31576
g. 46821
h. 3740
i. 8325

Now use the same ideas to arrange more than two numerals in order.
For example, to arrange $6,616,1,66,666,61$, and 16 in order from smallest to largest, use the following method:

1. First, sort the numerals with the same number of digits into groups.

- 6, 1
- 66, 16, 61
- and 616, 666

2. The group of one digit numerals contains 6 and 1 . As 1 is smaller than 6 , the list starts with 1 , then 6.
3. The group of two-digit numerals contains 66, 61, and 16. Use your skills in ordering numerals to see that 16 is smallest, then 61, and 66 is the largest of this group. The list now reads, 1, 6, 16, 61, 66.
4. Finally, look at the three-digit numerals, 616 and 666 . As 616 is smaller than 666 , it will come first. The list now reads:

- 1, 6, 16, 61, 66, 616, 666.

Arrange these numbers in order from smallest to largest. Check your work using the answer key at the end of the exercise.
a. 1 235; 1 352; 1 523; 1253
b. 47 259; 42 759; 45 279; 47592
c. 73 050; 76 940; 79 053; 73502
d. 456 719; 465 981; 546 423; 564082
e. 12 546; $5781 ; 423 ; 172901$
f. 114 444; 444; 14; 1114 444; 44
g. 777; 17; 71; 7 177; 717; 77177

## Answers to Exercise Three

a. $1235,1253,1352,1523$
b. 42 759, $45279,47259,47592$
c. $73050,73,502,76940,79053$
d. $456719,465981,546423,564082$
e. $423,5781,12546,172901$
f. $14,44,444,114444,1114444$
g. 17, 71, 717, 777, 7177,77177

## Greater Than, Less Than, Equal

The sign < means is less than (smaller than).
The sign > means is greater than (bigger than).
The greater than and less than signs always point to the smaller number (that is, the small part of the sign is close to the small number.)
$5<12 \quad 5$ is less than 12
$6>3 \quad 6$ is greater than 3
The sign = means equals and is used when two amounts are the same.
The sign means not equal to and is used when two amounts are not the same.

Write <, >, or = in each blank as needed. Check your work using the answer key at the end of the exercise.
a. 4376 $\qquad$ 12376
b. 342981 $\qquad$ 324762
c. 1520 $\qquad$ 1530
d. 5821 $\qquad$ 5821
e. 3674 3296
f. 6214 $\qquad$ 6251

Answers to Exercise Three
a. <
d. =
b. >
e. >
c. <
f. <

## Topic C: Self-Test

## Mark /12 <br> Aim 10/12

A. Box the larger number of each pair. (6 marks)
a. $9784 ; 7892$
b. 56 663; 56566
c. 13 204; 14420
d. 721 011; 721101
e. 461 300; 416003
f. $2879921 ; 2987721$
B. Arrange these numerals in order from smallest to largest. (2 marks)
a. 75; 754; 475; 47; $5747 ; 5774 ; 77575$
b. 18; 23 070; 429; 7 824; 37; 994; 1120
C. Write >, <. or = in each blank to make a true statement. (4 marks)
a. 3678 $\qquad$ 3768
b. 14002 $\qquad$ 14000
c. 38463 $\qquad$ 3846

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$$
\text { d. } 10010 \_10010
$$

## Answers to Topic C: Self-Test

A.
a. 9784 d. 721101
b. 56663
e. 461300
c. 14420
f. 2987721
B.
a. $47,75,475,754,5747,5774,77575$
b. $18,37,429,994,1120,7824,23070$
C.
a. <
c. >
b. >
d. =

## Topic D: Rounding Numbers

We use numbers a lot in our everyday lives. List some of the ways you use numbers.

- $\qquad$
- $\qquad$
- $\qquad$
You may have written money, shopping, time, and counting as part of your answer.
Think about time. Let's say it takes eight minutes to walk to the bus. If someone asks you how long it takes, you will probably say, "About ten minutes."

If you buy a sweater that costs $\$ 29$, you may say, "Oh, it was around thirty dollars."
How far is it from Vancouver to Prince George? The map says 796 km, but we would probably say, "About 800 kilometres."

You have just read examples of rounding numbers.
We round numbers for many reasons:

- We may not know the exact number.
- The exact number may not be important for what we are doing.
- We may need a quick way to figure something out.

When you are rounding numbers, use zeros to hold the places at the end of the number. Work through the following examples and exercises carefully. Rounding is an important skill.

## Rounding to the Nearest Hundred

A number rounded to the nearest hundred will have zeros in the ones place and in the tens place. The number will end with $000,100,200,300,400,500,600,700,800$, or 900.

When rounding to the nearest 100, we are looking for the closest group of 100 .

Example: 200, 220 and 300.

200


220


300


Is 220 closer to 200 or 300 ? It is closer to 200 .
Which gives a better estimate of 220 ... 2 hundreds or 3 hundreds? 2 hundreds
If we round 220 to nearest hundred, the result would be 200 .

Remember: The rounded number has zeroes in the tens and ones places.



400


Is 348 closer to 300 or 400 ? It is closest to 300 .
Which gives a better estimate of $348 \ldots .3$ hundreds or 4 hundreds? 3 hundreds
If we round 348 to the nearest 100 , the result would be 300 .

Remember: The rounded number has zeroes in the tens and ones places.

Example: 600, 650 and 700

600


650


700


Is 650 closer to 600 or 700 ? It is closer to 700 .
Which gives a better estimate of 650 ..... 6 hundreds or 7 hundreds? 7 hundreds. If we round 650 to the nearest hundred, the result would be 700 .

When we round a number which has a 5 in the tens place, we always round up to the next hundred.
If we round 650 to nearest hundred, the result would be 700 .

Example: Round 584 to the nearest 100.

584 is between 5 hundreds and 6 hundreds.
584 is closer to 6 hundreds.
Rounded number is 600 .

## Exercise One

Round each number to the nearest 100 . Check your work using the answer key at the end of the exercise.
a. 232 is between $\qquad$ hundreds and $\qquad$ hundreds. 232 is closest to $\qquad$ hundreds. Rounded number is $\qquad$ .
b. 647 is between $\qquad$ hundreds and $\qquad$ hundreds. 647 is closest to $\qquad$ hundreds. Rounded number is $\qquad$ .
c. 881 is between $\qquad$ hundreds and $\qquad$ hundreds. 881 is closest to $\qquad$ hundreds. Rounded number is $\qquad$ _.
d. 152 is between $\qquad$ hundreds and $\qquad$ hundreds. 152 is closest to $\qquad$ hundreds.
Rounded number is $\qquad$ .
e. 326 is between $\qquad$ hundreds and $\qquad$ hundreds. 326 is closest to $\qquad$ hundreds. Rounded number is $\qquad$ .

|  | Number | Closer to___ hundreds | Rounded Number |
| :--- | :--- | :--- | :--- |
| f. | 43 | 0 hundreds | 0 |
| g. | 188 |  |  |
| h. | 275 |  |  |
| i. | 620 |  |  |
| j. | 750 |  |  |
| k. | 549 |  |  |
| l. | 499 | 821 |  |
| m. |  |  |  |
| n. | 999 |  |  |

Answers to Exercise One
a. 2 hundreds 200
h. 3 hundreds 300
b. 6 hundreds 600
i. 6 hundreds 600
c. 9 hundreds 900
j. 8 hundreds 800
d. 2 hundreds 200
k. 5 hundreds 500
e. 3 hundreds 300
l. 5 hundreds 500
f. 0 hundreds 0
m. 8 hundreds 800
g. 2 hundreds 200
n. 10 hundreds 1000

Now look at a shorter method to round to the nearest 100.
When rounding to the nearest hundred, do this:

## Step 1: Underline the hundreds place.

Step 2: Look at the digit following in the tens place.
$\downarrow$
468

Step 3: If the digit in the tens place is less than 5,

- write a zero in the tens place and the ones place.
- leave the hundreds digit as it is.


## $\downarrow$

rounds to 300 (329 is nearer to 300 than to 400)
$\downarrow$
$\underline{8} 46$ rounds to 800
$\downarrow$
608 rounds to 600

Step 4: If the digit in the tens place is 5 or more,

- write a zero in the tens place and the ones place.
- add one more hundred to the hundreds place.
$\downarrow$
rounds to $400(362$ is nearer to 400 than to 300$)$
$\downarrow$ rounds to 900
$\underline{9} 64$ rounds to $\mathbf{1} \mathbf{0 0 0}$ (one hundred more than 9 hundreds is 10 hundreds)
Note: If you are rounding to the nearest hundred, one and two-digit numerals round like this:
- the numbers from 0 to 49 round to 0
- the numbers from 50 to 99 round to 100 .


## Exercise Two

Round your answer to the nearest hundred. Check your work using the answer key at the end of the exercise.
a. $426=$ $\qquad$ f. $211=$
b. $395=$ $\qquad$ g. $965=$
c. $638=$ $\qquad$ h. $438=$
d. $95=$ $\qquad$ i. $703=$ $\qquad$
e. $31=$
$\qquad$ j. $796=$

Any number can be rounded to the nearest hundred.

```
    \downarrow \downarrow \downarrow
```


k. $8372=$ $\qquad$
l. $2082=$ $\qquad$
m. $21639=$ $\qquad$
n. $42983=$ $\qquad$

```
o. \(125438=\)
p. \(12651=\)
``` \(\qquad\)
```

q. $3888=$

``` \(\qquad\)
```

r. $9109=$

``` \(\qquad\)

Answers to Exercise Two
a. 400
b. 400
c. 600
d. 100
e. 0
f. 200
g. 1000
h. 400
i. 700
j. 800
k. 8400
l. 2100
m. 21600
n. 43000
o. 125400
p. 12700
q. 3900
r. 9100

\section*{Rounding to the Nearest Thousand}

A number rounded to the nearest thousand will have zeros in the ones, tens, and hundreds places. The number will end with 0 000, 1 000, 2 000, 3 000, 4 000, 5 000, 6000,7000 ,

8000 , or 9000.
When rounding to the nearest thousand, do this:

\section*{Step 1: Underline the thousands place.}

4398
Step 2: Look at the digit following in the hundreds place.
\(\downarrow\)
4398

Step 3: If the digit in the hundreds place is less than 5,
- write a zero in the hundreds place, the tens place, and the ones place.
- leave the thousands digit as it is.
\(\underline{4} 398\) rounds to 4000 (4398 is nearer to 4000 than to 5000 )

325263 rounds to 325000

Step 4: If the digit in the hundreds place is 5 or more,
- write a zero in the hundreds, tens, and ones places.
- add one more thousand to the thousands place.
\(\downarrow\)
\(\underline{2} 884\) rounds to 3000 (2884 is nearer to 3000 than to 2000 )
\(\downarrow\)
\(8 \underline{6} 583\) rounds to 87000
\(2 \underline{9} 965\) rounds to \(\mathbf{3 0} 000\)
Note: If you are rounding to the nearest thousand, one, two, and three-digit numerals round like this:
- numerals from 0 to 499 round to \(\mathbf{0}\)
- numerals from 500 to 999 round to \(\mathbf{1 0 0 0}\).

\section*{Exercise Three}

Round your answer to the nearest thousand. Check your work using the answer key at the end of the exercise.
a. \(3829=\) \(\qquad\) g. \(2096=\)
b. \(2499=\) \(\qquad\) h. \(23719=\) \(\qquad\)
c. \(8309=\) \(\qquad\) i. \(45245=\) \(\qquad\)
d. \(4520=\) \(\qquad\) j. \(8129=\)
e. \(9724=\) \(\qquad\) k. \(123542=\)
\(\qquad\)
f. \(386=\)
l. \(91871=\)

Answers to Exercise Three
a. 4000
b. 2000
c. 8000
d. 5000
e. 10000
f. 0
g. 2000
h. 24000
i. 45000
j. 8000
k. 124000
l. 92000

\section*{Rounding to the Nearest Ten Thousand}

A number rounded to the nearest ten thousand will have zeros in the ones, tens, hundreds and thousands places. The number will end with 0000 , \(10000,20000,30000,40000,50000,60000\), 70000 , 80000 , or 90000.

When rounding to the nearest ten thousand, do this:

\section*{Step 1: Underline the ten thousands place.}

42398
Step 2: Look at the digit following in the thousands place.
\(\downarrow\)
42398

Step 3: If the digit in the thousands place is less than 5,
- write a zero in the thousands place, the hundreds place, the tens place, and the ones place.
- leave the ten thousands digit as it is.
\(\underline{42} 398\) rounds to 40000 ( 42398 is nearer to 40000 than to 50000 ) \(\downarrow\)
253263 rounds to 250000

Step 4: If the digit in the thousands place is \(\mathbf{5}\) or more,
- write a zero in the thousands, hundreds, tens, and ones places.
- add one more thousand to the thousands place.
    \(\downarrow\)
\(\underline{28} 884\) rounds to 29000 ( 28884 is nearer to 29000 than to 28000 )

867583 rounds to \(\mathbf{8 7 0} 000\)
    \(\downarrow\)
\(2 \underline{9} 9965\) rounds to \(\mathbf{3 0 0} 000\)

Note: If you are rounding to the nearest ten thousand, one, two, three and four- digit numerals round like this:
- numerals from 0 to 4999 round to 0
- numerals from 5000 to 9999 round to 10000 .

\section*{Exercise Four}

Round your answer to the nearest ten thousand. Check your work using the answer key at the end of the exercise.
a. 123542 f. 73816
b. 91871
g. 41171
c. 41724
h. 52963
d. 80910
i. 829527
e. 14639
j. 1624099

Answers to Exercise Four
a. 120000
b. 90000
c. 40000
d. 80000
e. 10000
f. 70000
g. 40000
h. 50000
i. 830000
j. 1620000

\section*{Rounding to the Nearest Hundred Thousand}

A number rounded to the nearest hundred thousand will have zeros in the ones, tens, hundreds, thousands and ten thousands places. The number will end with \(000000,100000,200000,300000\), \(400000,500000,600000,700000,800000\), or 900000.

When rounding to the nearest hundred thousand, do this:

\section*{Step 1: Underline the hundred thousands place.}

414398
Step 2: Look at the digit following in the ten thousands place.
\(\downarrow\)
414398

Step 3: If the digit in the ten thousands place is less than 5,
- write a zero in the ten thousands place, the thousands place, the hundreds place, the tens place, and the ones place.
- leave the hundred thousands digit as it is.

414398 rounds to 400000 (414 398 is nearer to 400000 than to 500000 ) \(\downarrow\)
536263 rounds to 500000

Step 4: If the digit in the thousands place is 5 or more,
- write a zero in the ten thousands place, thousands place, hundreds place, tens place, and ones place.
- add one more thousand to the hundred thousands place.
\(\downarrow\)
\(\underline{2} 81884\) rounds to \(\mathbf{3 0 0} 000\) (281884 is nearer to 300000 than to 200000 )
\(\downarrow\)
\(6 \underline{72} 583\) rounds to \(\mathbf{7 0 0} 000\)

\(9 \underline{9} 9965\) rounds to 1000000

Note: If you are rounding to the nearest hundred thousand, one, two, three, four and five-digit numerals round like this:
- numerals from 0 to 49999 round to 0
- numerals from 50000 to 99999 round to 100000.

Round your answer to the nearest hundred thousand. Check your work using the answer key at the end of the exercise.
a. 143829
b. 12499
c. 861309
d. 472520
e. 96724
f. 386174
g. 221096
h. 283716
i. 457245
j. 87129

Answers to Exercise Five
a. 100000
b. 0
c. 900000
d. 500000
e. 100000
f. 400000
g. 200000
h. 300000
i. 500000
j. 100000

\section*{Rounding to the Nearest Million}

A number rounded to the nearest million will have zeros in the ones, tens, hundreds, thousands, ten thousands and hundred thousands places. The number will end with 000 000, 1000000,2000000 , 3000 000, 4000 000, \(5000000,6000000,7000000,8000000\), or 9000000.

When rounding to the nearest million, do this:

\section*{Step 1: Underline the millions place.}

4214398

\section*{Step 2: Look at the digit following in the hundred thousands place.}

\section*{\(\underline{4} 214398\)}

Step 3: If the digit in the hundred thousands place is less than 5 ,
- write a zero in the hundred thousands place, the ten thousands place, the thousands, the hundreds place, the tens place, and the ones place.
- leave the millions digit as it is.

4214398 rounds to 4000000 (4 214398 is nearer to 4000000 than to 500000 )
5367263 rounds to 5000000
\(\underline{4} 214398\) rounds to \(4000000(4214398\) is nearer to 4000000 than to 5000000\()\) \(\downarrow\)
5367263 rounds to 5000000

Step 4: If the digit in the hundred thousands place is 5 or more,
- write a zero in the hundred thousands place, the ten thousands place, the thousands place, the hundreds place, tens place, and ones place.
- Add one more thousand to the Thousand place.

2818884 rounds to 3000000 (2 818884 is nearer to 3000000 than to 2000000 )
6729583 rounds to 7000000
9991965 rounds to 10000000

\(\underline{2} 818884\) rounds to 3000000 (281 884 is nearer to 300000 than to 200000 ) \(\downarrow\)
\(\underline{6} 729583\) rounds to \(\mathbf{7 0 0} 000\)
\(\downarrow\)
\(\underline{9} 991965\) rounds to 10000000

\section*{Exercise six}

Round to the Nearest Million. Note: If you are rounding to the nearest million, one, two, three, four, five and six-digit numerals round like this:
- numerals from 0 to 499999 round to 0
- numerals from 500000 to 999999 round to 1000000.
a. 6123542
d. 2801910
b. 2391871
e. 941639
c. 5419724
f. 3736816
g. 3413171
h. 4525963
i. 1829527
j. 1624099

\section*{Answers to Exercise Six}
a. 6000000
b. 2000000
c. 5000000
d. 3000000
e. 1000000
f. 1000000
g. 3000000
h. 5000000
i. 2000000
j. 2000000

\section*{Exercise Seven}

For each problem, round to the number asked. Check your work using the answer key at the end of the exercise.

Example: Juan had 1094 baseball cards. Adamo has 2106 baseball cards. Ho has 1589 baseball cards.
Round each number to the nearest 100 .
\begin{tabular}{|l|l|l|}
\hline Name & Number & Rounded Number \\
\hline Juan & 1094 & 1100 \\
\hline Adamo & 2106 & 2100 \\
\hline Ho & 1589 & 1600 \\
\hline
\end{tabular}
a. On Friday, 5479 people went the football game. On Saturday, 4388 people went to the football game. On Sunday 4834 people went to the basketball Round each number to the nearest hundred.
\begin{tabular}{|l|l|l|}
\hline Day & Number & Rounded Number \\
\hline Friday & & \\
\hline Saturday & & \\
\hline Sunday & & \\
\hline
\end{tabular}
b. Mount Logan in the Yukon is the highest mountain in It is 5956 meters. Mount Waddington is the highest mountain in British Columbia. It is 4019 meters. Mount Columbia is the highest mountain in Alberta. It is 3741 meters. Round each number to the nearest hundred.
\begin{tabular}{|l|l|l|}
\hline Mountain & Number & Rounded Number \\
\hline Mount Logan & & \\
\hline Mount Waddington & & \\
\hline Mount Columbia & & \\
\hline
\end{tabular}
c. The Connaught Tunnel is 8082 meters long, The Mount MacDonald Tunnel is 14700 meters long. The Deas Island Tunnel is 629 meters Round each number to the nearest thousand.
\begin{tabular}{|l|l|l|}
\hline Tunnel & Number & Rounded Number \\
\hline Connaught Tunnel & & \\
\hline Mount MacDonald Tunnel & & \\
\hline Deas Island Tunnel & & \\
\hline
\end{tabular}

\section*{Answers to Exercise Seven}
a.
\begin{tabular}{|l|l|l|}
\hline Day & Number & Rounded Number \\
\hline Friday & 5479 & 5500 \\
\hline Saturday & 4388 & 4400 \\
\hline Sunday & 4834 & 4800 \\
\hline
\end{tabular}
b.
\begin{tabular}{|l|l|l|}
\hline Mountain & Number & Rounded Number \\
\hline Mount Logan & 5965 meters & 6000 meters \\
\hline Mount Waddington & 4019 meters & 4000 meters \\
\hline Mount Columbia & 3741 meters & 3700 meters \\
\hline
\end{tabular}
c.
\begin{tabular}{|l|l|l|}
\hline Tunnel & Number & Rounded Number \\
\hline Connaught Tunnel & 8082 meters & 8000 meters \\
\hline Mount MacDonald Tunnel & 14700 meters & 15000 meters \\
\hline Deas Island Tunnel & 692 meters & 1000 meters \\
\hline
\end{tabular}

\section*{Topic D: Self-Test}
A. Round your answer to the nearest hundred. (4 marks)
a. 329
b. 2481
c. 8065
d. 3916
B. Round your answer to the nearest thousand. (4 marks)
a. 5521
b. 21813
c. 46499
d. 34860
C. Round your answer to the nearest ten thousand. (4 marks_
a. 15521
b. 26318
c. 176994
d. 86486
D. Round your answer to the nearest hundred thousand. (4 marks)
a. 523521
b. 821932
c. 761949
d. 464051
E. Round your answer to the nearest million. (4 marks)
a. 7312908
b. 6009280
c. 9152801
d. 576679
F. For each problem, round to the number asked. 16 Marks
a. The longest river in North America is the Mississippi River which is 6275 kilometers long. The longest river in Canada is the Mackenize River which is 4242 kilometers long. The Yukon River is 3701 kilometers long. The St. Lawrence River is 3058 kilometers long. Round each number to the nearest hundred.
\begin{tabular}{|l|l|l|}
\hline River & Number & Rounded Number \\
\hline Mississippi River & & \\
\hline Mackenzie River & & \\
\hline Yukon River & & \\
\hline St. Lawrence River & & \\
\hline
\end{tabular}
b. In 2009, the population of Shanghai, China was 13831 900. The population of Moscow, Russia was 10508 971. The population of New York City, United States of America was 8363 710. The population of Vancouver, Canada was 578041. Round each of these numbers to the nearest hundred thousand.
\begin{tabular}{|l|l|l|}
\hline City & Number & Rounded Number \\
\hline Shanghai, China & & \\
\hline Moscow, Russia & & \\
\hline New York City, USA & & \\
\hline Vancouver, Canada & & \\
\hline
\end{tabular}

\section*{Answers to Topic D Self-Test}
A.
a. 300
a. 6000
a. 20000
a. 500000
a. 7000000
b. 2500
b. 22000
b. 30000
b. 800000
b. 6000000
c. 8100
c. 46000
d. 4000
B.
d. 35000
C.
c. 180000
c. 800000
d. 860000
D.
c. 9000000
d. 500000
E.
d. 1000000
F.
a.
\begin{tabular}{|l|l|l|}
\hline River & Number & Rounded Number \\
\hline Mississippi River & 6275 kilometers & 6300 kilometers \\
\hline Mackenzie River & 4242 kilometers & 4200 kilometers \\
\hline Yukon River & 3701 kilometers & 3700 kilometers \\
\hline St. Lawrence River & 3058 kilometers & 3100 kilometers \\
\hline
\end{tabular}
b.
\begin{tabular}{|l|l|l|}
\hline City & Number & Rounded Number \\
\hline Shanghai, China & 13831900 people & 13800000 people \\
\hline Moscow, Russia & 10508971 people & 10500000 people \\
\hline New York City, USA & 8363710 people & 8400000 people \\
\hline Vancouver, Canada & 578041 people & 600000 people \\
\hline
\end{tabular}

\section*{Unit 1 Review: Number Sense}

You will now practice all the skills you learned in Unit 1. Check your work using the answer key at the end of the review.
A. Write the place value names (ones, tens, hundreds, thousands, ten thousands, hundred thousands, millions) for each bolded digit.
a. 4392
b. 765
c. 18293
d. 56428
e. 3641758
f. 426153
g. 8429576
h. 4258
B. Using the number \(\mathbf{3 4 9} 285\) 106, write the digit that is in each of the following place values.
a. millions
e. hundreds
b. ones
f. hundreds thousands
c. ten thousands
g. tens
d. thousands
C. Underline the digit for the place value named.
a. hundreds, 5321
d. hundred thousands, 891402
b. tens, 8703
e. thousands, 72491
c. ten thousands, 34891
f. millions, 4201856
D. Write the word names for the numbers.
a. 818
b. 1678
c. 29764
d. 1984152
e. 42803
f. 226917
E. Write the numerals for these word names.
a. twenty-five thousand one hundred thirty-two
b. one thousand two hundred seven
c. two hundred fifteen thousand twenty-four
d. one million six hundred ninety-five thousand four hundred twenty
e. seven hundred twenty-six
f. nine thousand four
F. Write each number in expanded form.
a. 184
b. 3908
c. 61281
d. 1539587
e. 366524
G. Write each number from expanded form.
a. \(50000+6000+600+90+8\)
b. \(200000+70000+8000+200+60+1\)
c. \(3000+800+80+5\)
d. \(1000000+400000+70000+6000+100+50+3\)
e. \(700+1\)
H. Arrange these numbers in order from smallest to largest.
a. \(18 ; 34937 ; 727 ; 1487 ; 147832\)
b. 769; 6 790; 697; 76 976; 76796
I. Write <, >, or = in each blank as needed.
a. 9698 \(\qquad\) 6899
d. 124693 \(\qquad\) 124693
b. 7542 \(\qquad\) 7452
e. \(738423 \ldots 783423\)
c. 34682 \(\qquad\) 39421
f. 45832 \(\qquad\) 54123
J. Round each number to the nearest hundred.
a. 774
b. 2581
c. 21204
d. 692
e. 572098
f. 7652931
K. Round each number to the nearest thousand.
a. 948
b. 75767
c. 288869
d. 479
e. 3976
f. 5012
L. Round each number to the nearest ten thousand.
a. 4028
b. 226917
c. 126804
d. 9794487
e. 87805
f. 5912
M. Round each number to the nearest hundred thousand.
a. 687029
b. 1326876
c. 523715
d. 4766883
e. 8182390
f. 792013
N. Round each number to the nearest million.
a. 1009627
b. 28101052
c. 894063
d. 9778656
e. 80379591
f. 3102975
O. Word Problems.
a. The three heaviest sharks are the whale shark weighing 30500 kilograms. The basking shark weighing 9258 kilograms. The great white shark weighing 3507 kilograms. Round each number to the nearest thousand.
\begin{tabular}{|l|l|l|}
\hline Shark & Number & Rounded Number \\
\hline Whale shark & & \\
\hline Basking shark & & \\
\hline Great White Shark & & \\
\hline
\end{tabular}
b. Three of the largest islands in the world are New Guinea covering 785753 square kilometers, Baffin Island covering 503944 square kilometers and Honshu Island covering 227413 square kilometers. Round each number to the nearest ten thousand.
\begin{tabular}{|l|l|l|}
\hline Island & Number & Rounded Number \\
\hline New Guinea & & \\
\hline Baffin Island & & \\
\hline Honshu Island & & \\
\hline
\end{tabular}

\section*{Answers to Unit 1 Review - Number Sense}
A.
a. tens
e. hundred thousands
b. ones
f. ten thousands
c. thousands
g. millions
d. hundreds
h. thousands
B.
a. 2
a. 5321
b. 6
b. 8703
c. 8
c. 34891
d. 5
d. 891402
e. 1
e. 72491
f. 2
g. 0
C.
f. 4201856
D.
a. eight hundred eighteen
b. one thousand six hundred seventy-eight
c. twenty-nine thousand seven hundred sixty-four
d. one million nine hundred eighty-four thousand one hundred fifty-two
e. forty-two thousand eight hundred three
f. two hundred twenty-six thousand nine hundred seventeen
E.
a. 25132
b. 1207
c. 215024
d. 1695420
e. 726
f. 9004
F.
a. \(100+80+4\)
\[
+500+80+7
\]
b. \(3000+900+8\)
e. \(300000+60000+6000+500+20+\)
c. \(60000+1000+200+80+1\) 4
d. \(1000000+500000+30000+9000\)
G.
a. 56698
b. 278261
c. 3885
d. 1476153
e. 701
H.
a. \(18,727,1487,34937,147832\)
b. 697, 769, \(6790,76796,76976\)
I.
a. >
d. =
b. >
e. <
c. <
f. <
J.
a. 800
b. 2600
c. 21200
d. 700
e. 572100
f. 7652900
K.
a. 1000
b. 76000
c. 289000
d. 0
e. 4000
f. 5000
L.
a. 0
b. 230000
c. 130000
d. 9790000
e. 90000
f. 10000
M.
a. 700000 d. 4800000
b. 1300000
e. 8200000
c. 500000
f. 800000

N .
a. 1000000
b. 28000000
c. 1000000
d. 10000000
e. 80000000
f. 3000000
O.
a.
\begin{tabular}{|l|l|l|}
\hline Shark & Number & Rounded Number \\
\hline Whale shark & 30500 & 31000 \\
\hline Basking shark & 9258 & 9000 \\
\hline Great White Shark & 3507 & 4000 \\
\hline
\end{tabular}
b.
\begin{tabular}{|l|l|l|}
\hline Kilometers & Number & Rounded Number \\
\hline New Guinea & 785753 & 790000 \\
\hline Baffin Island & 503944 & 500000 \\
\hline Honshu Island & 227413 & 230000 \\
\hline
\end{tabular}

CONGRATULATIONS!!
Now you have finished Unit 1.

TEST TIME!
Ask your instructor for the Practice Test for this unit.
Once you've done the practice test, you need to do the unit 1 test.

Again, ask your instructor for this.
Good luck!

\section*{Unit 2: Addition}

\section*{Topic A: Addition}

Addition puts amounts together. The answer of addition is called the sum or the total.
The plus sign + means to add.
\[
\diamond \diamond \diamond+\diamond \diamond=\diamond \diamond \diamond \diamond \diamond
\]
\(3+2=5\) says three plus two equals five or three and two is five.
The sum is 5 .

\section*{Exercise One}

Check out your addition facts by doing this exercise as quickly as possible without counting. The highest total or sum (what the numbers add up to) for these number facts is 20 . Check your work using the answer key at the end of the exercise. Then, make a list of any addition facts you do not know or which are slow - practice them. If you feel you need more practice, see your instructor.
6
a. \(\begin{array}{r}+\quad 7 \\ \hline 13\end{array}\)
e. +2
i. +6
b. \(\begin{array}{r}8 \\ +\quad 3 \\ \hline 11\end{array}\)
6
f. +4
j. +3
\(\begin{array}{r}4 \\ \text { с. } \quad+\quad 2 \\ \hline\end{array}\)
\(\qquad\) g. +8
\(\begin{array}{r}9 \\ \text { k. } \quad+\quad 7 \\ \hline\end{array}\)
8
2
d. +7
h. +5
1. +2

\section*{Answers to Exercise One}
a. 13
f. 10
k. 16
b. 11
g. 13
l. 9
c. 6
h. 7
m. 8
d. 15
i. 13
ก. 8
e. 3
j. 3

\section*{Addition of Larger Numbers}

Use these steps to complete each addition question.
- Step 1: Add the ones to the ones.
- Step 2: Add the tens to the tens.
- Step 3: Add the hundreds to the hundreds.
- Step 4: Add the thousands to the thousands.
- Step 5: Add the ten thousands to the ten thousands.

\section*{Example A: \(23+56=\)}

Step 1: Add the ones to the ones. 3 ones +6 ones \(=9\) ones
\[
\begin{array}{r}
23 \\
+\quad 56 \\
\hline 9
\end{array}
\]

Write the answer in line with the ones in the question.
Step 2: Add the tens. 2 tens +5 tens \(=7\) tens
23
\(+\quad 56\)
79
The sum of \(23+56=79\)

Find the sums. Check your work using the answer key at the end of the exercise.
37
51
23
a. +42
i. +23
q. +64
55
12
53
b. +22
j. +46
r. +42
70
17
c. \(+\quad 17\)
k. +21
s. +23
27
d. +32
\(\begin{array}{r}70 \\ \text { 1. } \\ +\quad 28 \\ \hline\end{array}\)
0
t. +10
\(+10\)
87
e. +12
54
m. +23
u. +13
58
f. +64
n. +14
v. +21
44
g. +50
15
31
o. +12
w. +28
\(\begin{array}{r}34 \\ \text { h. } \quad 11 \\ \hline\end{array}\)
45
24
p. \(+\quad 23\)
x. +13

\section*{Answers to Exercise Two}
a． 79
i． 74
q． 87
b． 77
j． 58
r． 95
c． 87
k． 38
s． 83
d． 59
l． 98
t． 59
e． 99
m． 77
u． 88
f． 97
n． 76
v． 79
g． 94
o． 27
w． 59
h． 45
p． 68
x． 37

\section*{Exercise Three}

Find the sums．Check your work using the answer key at the end of the exercise．
32
63
41
a．+64
f．+33
k．+38

23
75
54
b．+54
g．+24
1．+45

61
46
25
c．+22
h．+12
m．+32
83
d．\(+\quad 11\)

44
35
i．+35
ก．+42

32
e． \(\begin{array}{r}35 \\ \hline\end{array} ⿳ 亠 口 子\)
\[
25
\]
\[
32
\]
j．+42
o．\(+\quad 44\)
22
p. +14
s. +23
v. +25
57
25
34
q. +21

42
r. +54
u. \(+\quad 41\)
t. +42
w. +62

77
x. \(+\quad 21\)

\section*{Answers to Exercise Three}
a. 96
b. 77
c. 83
d. 94
e. 77
f. 96
g. 99
h. 58
i. 79
j. 67
k. 79
l. 99
m. 57
n. 77
o. 76
p. 36
q. 78
r. 96
s. 57
t. 67
u. 54
v. 85
w. 96
x. 98

To add three or more numbers together, use the following steps.
- Step 1: Add the ones to the ones.
- Step 2: Add the tens to the tens.
- Step 3: Add the hundreds to the hundreds.
- Step 4: Add the thousands to the thousands.
- Step 5: Add the ten thousands to the ten thousands.
```

Example B: 24 + 52 + 73=

```

Step 1: Add the ones. 4 ones +2 ones +3 ones \(=9\) ones
\[
\begin{array}{r}
24 \\
52 \\
+\quad 73 \\
\hline 9
\end{array}
\]

Step 2: Add the tens. 2 tens +5 tens +7 ten = \(\mathbf{1 4}\) tens
\[
\begin{array}{r}
24 \\
52 \\
+\quad 73 \\
\hline 149
\end{array}
\]

\section*{Exercise Three}
21
2044
a.
34
\[
+\quad 44
\]
d.
43
\(+36\)
g.
50

11
b.
\[
+\quad 15
\]
23
38
c.
\[
+\quad 41
\]
13
37
h.
42
\begin{tabular}{l}
\(+\quad 10\) \\
\hline
\end{tabular}
55
i. \(\begin{array}{r}24 \\ +\quad 30 \\ \hline\end{array}\)
82
j.
\(+50\)
32
o.
23
o. +94
45
33
55
p.
\(+\quad 21\)
56
t.
31
\[
+\quad 82
\]
32
u.
45
\begin{tabular}{r} 
\\
\(+\quad 51\) \\
\hline
\end{tabular}
70
31
q.
12
1.
\[
+\quad 48
\]
12
54
m.
\(\begin{array}{r} \\ +\quad 62 \\ \hline\end{array}\)
25
61
n. \(\begin{array}{r}61 \\ +\quad 22 \\ \hline\end{array}\)
s.
41
r.

51
w.
27
\begin{tabular}{l}
\(+\quad 41\) \\
\hline
\end{tabular}
v.
\(+\quad 35\)
\(+\quad 30\)24
\[
\begin{aligned}
& \\
& +\quad 30 \\
& \hline
\end{aligned}
\]

\section*{Answers to Exercise Four}
a. 99
b. 87
c. 102
d. 99
e. 89
f. 119
g. 118
h. 89
i. 109
j. 149
k. 129
l. 139
m. 128
n. 108
o. 149
p. 109
q. 128
r. 159
s. 109
t. 169
u. 128
v. 119
w. 119
x. 67

\section*{Exercise Five}

Find the sums. Check your work using the answer key at the end of the exercise.
32
41
g. \(\begin{array}{r}32 \\ +\quad 96 \\ \hline\end{array}\)
37
m.
12
53
a.
\begin{tabular}{r}
14 \\
\(+\quad 1\) \\
\hline
\end{tabular}
\(\begin{array}{r}+\quad 14 \\ \hline\end{array}\)
42
31
h.
\begin{tabular}{l}
\(+\quad 85\) \\
\hline
\end{tabular}
63
n.
25
\begin{tabular}{l}
\(+\quad 70\) \\
\hline
\end{tabular}
b.
\begin{tabular}{l}
\(+\quad 11\) \\
\hline
\end{tabular}
24
81
c.
\[
\begin{array}{r}
+\quad 13 \\
\hline
\end{array}
\]
15
70
o.
\(+65\)
i.
52
\(\begin{array}{r}+\quad 82 \\ \hline\end{array}\)
52
24
d.
\[
\begin{array}{r}
+\quad 63 \\
\hline
\end{array}
\]
j.
43
25
p.
41
\begin{tabular}{l}
\(+\quad 73\) \\
\hline
\end{tabular}
54
23
e.
\[
\begin{array}{r}
+\quad 71 \\
\hline
\end{array}
\]
81
41
q.
66
\(\begin{array}{r}66 \\ +\quad 32 \\ \hline\end{array}\)
k.
16
\begin{tabular}{l}
\(+\quad 42\) \\
\hline
\end{tabular}
25
f.
        \(\begin{array}{r}+\quad 84 \\ \hline\end{array}\)
56
31
\(+\quad 92\)
24
r.
33
r. +62
52
64
45
s.
\(+\quad 21\)
u.
12
\(\begin{array}{r}1 \\ +\quad 90 \\ \hline\end{array}\)
26
w.
61
w.
```

$\begin{array}{r}+\quad 82 \\ \hline\end{array}$

```
71
16
t.
42
\(+\quad 16\)
v.
21
\(\begin{array}{r}+\quad 43 \\ \hline\end{array}\)
55

\section*{Answers to Exercise Five}
a. 99
b. 78
c. 118
d. 139
e. 148
f. 169
g. 169
h. 159
i. 149
j. 116
k. 139
l. 179
m. 129
n. 158
o. 159
p. 139
q. 139
r. 119
s. 118
t. 129
u. 166
v. 119
w. 169
x. 128

Use these steps to complete each addition question.
- Step 1: Add the ones to the ones.
- Step 2: Add the tens to the tens.
- Step 3: Add the hundreds to the hundreds.

\section*{Example C: \(372+415\)}

Step 1: Add the ones. 2 ones +5 ones \(=7\) ones
\[
\begin{array}{r}
372 \\
+\quad 415 \\
\hline 7
\end{array}
\]

Step 2: Add the tens. 7 tens +1 ten \(=8\) tens
\[
\begin{array}{r}
372 \\
+\quad 415 \\
\hline 87
\end{array}
\]

Step 3: Add the hundreds. 3 hundreds +4 hundreds \(=7\) hundreds
\[
\begin{array}{r}
372 \\
+\quad 415 \\
\hline 787
\end{array}
\]

\section*{Exercise Six}

Find the sums. Check your work using the answer key at the end of the exercise.
324
174 738
a. +865
е. +922
i. +510
514
250
321
b. +274
f. +618
j. +358
673
c. +326
506
215
g. +182
k. +584
603
514
d. +375
h. +482
1. +352
\(\begin{array}{r}167 \\ \text { m. } \quad 522 \\ \hline\end{array}\)

315
ก. +573

156
253
s. +644

713
p. +256

135
q. +564

105
r. +632
o. +732
s. \(+\quad 644\)

535
t. +442
v. +162 422422

\section*{Answers to Exercise Six}
a. 1189
b. 788
c. 999
d. 978
e. 1096
f. 868
g. 688
h. 996
i. 1248
j. 679
k. 799
l. 768
m. 689
n. 888
o. 888
p. 969
q. 699
r. 737
s. 897
t. 977
u. 589
v. 996
w. 783
x. 789

\section*{Exercise Seven}

Find the sums. Check your work using the answer key at the end of the exercise.
754
410
653
a. +231
b. +257
c. \(+\quad 142\)
d． \(\begin{array}{r}815 \\ +\quad 170 \\ \hline\end{array}\)
357
k．+130
r．+254
243
e．+146
\(\begin{array}{r}615 \\ \text { f．} \\ +\quad 303 \\ \hline\end{array}\)
124
g．+762
451
h．+206
705
i． \(\begin{array}{r} \\ +\quad 261 \\ \hline\end{array} ⿳ 亠 口\)
\(\begin{array}{r}627 \\ \text { j．} \\ +\quad 512 \\ \hline\end{array}\)
\(\begin{array}{r} \\ \text { q．} \\ +\quad 275 \\ \hline\end{array}\)
p．\(+\quad 132\)
w．+321
v． \(\begin{array}{r}145 \\ +\quad 213 \\ \hline\end{array} ⿳ 亠 口 子\)
o．\(+\quad 137\)
357
n．\(+\quad 203\)
652
m．\(+\quad 902\)
t．+306
243
u．\(+\quad 152\)
v． \(\begin{array}{r}145 \\ +\quad 213 \\ \hline\end{array} ⿳ 亠 口 子\)
s．\(+\quad 321\)
524
1．\(+\quad 273\)
s．+321
723
\(+\)
262
\(\begin{array}{r} \\ \text { x．} \quad+\quad 131 \\ \hline\end{array}\)

\section*{Answers to Exercise Seven}
a． 985
h． 657
o． 789
b． 667
i． 966
p． 489
c． 795
j． 1139
q． 889
d． 985
k． 487
r． 1056
e． 389
l． 998
s． 845
f． 918
m． 1655
t． 1029
g． 886
ก． 628
u． 395
v. 358
w. 583
x. 676

To add three or more numbers together, use the following steps.
- Step 1: Add the ones to the ones.
- Step 2: Add the tens to the tens.
- Step 3: Add the hundreds to the hundreds.
```

Example D: $372+415+210$

```

Step 1: Add the ones. 2 ones +5 ones +0 ones \(=7\) ones
\[
\begin{array}{r}
372 \\
415 \\
+\quad 210 \\
\hline 7
\end{array}
\]

Step 2: Add the tens. 7 tens +1 ten +1 ten \(=9\) tens
372
415
\(+\quad 210\)
97
Step 3: Add the hundreds. 3 hundreds +4 hundreds +2 hundreds \(=9\) hundreds
\begin{tabular}{r}
372 \\
415 \\
\(+\quad 210\) \\
\hline 997
\end{tabular}

\section*{Exercise Eight}
\begin{tabular}{rlrl}
345 \\
132 \\
a. \\
\(+\quad 421\) \\
\hline
\end{tabular}
524
b. \(\begin{array}{r}630 \\ +\quad 721 \\ \hline\end{array}\)
\(+\quad 721\)
h.
322
\(+833\)

641
n.

253

305
132
272
o.
315
\(+410\)
131
c.
\[
\begin{array}{r}
422 \\
\hline
\end{array}
\]
i.
254
\(+\quad 413\)
214
d.
\begin{tabular}{l}
\(+\quad 932\) \\
\hline
\end{tabular}
821
324
e.
\[
\begin{array}{r}
+\quad 423 \\
\hline
\end{array}
\]
k.
245
353
301
\(+\quad 624\)

713
514
p.
231
\(+620\)
j.

102
\(+860\)246

q.

351
\[
\begin{array}{r}
+\quad 502 \\
\hline
\end{array}
\]
341
1. \(\begin{array}{r}215 \\ +\quad 840 \\ \hline\end{array}\)
152
r.
331
\(\begin{array}{r}\text { r. } \\ +\quad 216 \\ \hline\end{array}\)

164
233
s.
\(\begin{array}{r}+\quad 801 \\ \hline\end{array}\)

414

362
627
u.
\(+\quad 510\)
264
535
v. \(\begin{array}{r} \\ +\quad 600 \\ \hline\end{array}\)

432
w. \(\begin{array}{r}653 \\ +\quad 313 \\ \hline\end{array}\)

631
216
x.


\section*{Answers to Exercise Eight}
a. 898
b. 1875
c. 858
d. 1487
e. 1568
f. 1278
g. 796
h. 1796
i. 799
j. 1675
k. 1369
l. 1396
m. 892
n. 688
o. 997
p. 1365
q. 1099
r. 699
s. 1198
t. 1197
u. 1499
v. 1399
w. 1398
x. 1399

\section*{Did you Know?}

Some people like to check their addition by adding a second time, starting with the bottom number instead of the top number. For example.
\begin{tabular}{r}
63 \\
+35 \\
\hline 98
\end{tabular}

Add: \(\begin{aligned} & 3+5=8 \\ & 6+3=9\end{aligned}\)
Check: \(\begin{aligned} & 5+3=8 \\ & 3+6=9\end{aligned}\)

\section*{Exercise Nine}

Find the sums. Check your addition a second time by starting at the bottom. Place a check mark ( \(\sqrt{ }\) ) beside your answer after you have added from the bottom to the top. Check your work using the answer key at the end of the exercise.
\(\begin{array}{r}7003 \\ \text { a. } \quad+\quad 2692 \\ \hline\end{array}\)
6518
20295
f. +2050
k. +46503
b. \(\begin{array}{r}6217 \\ +\quad 3732 \\ \hline\end{array}\)
1023
62041
g. +1553
1. \(+\quad 12857\)
\(\begin{array}{r}2271 \\ \text { c. } \quad 3618 \\ \hline\end{array}\)
4034
73104
h. +2853
m. +21620
d. \(\begin{array}{r}5992 \\ +\quad 3006 \\ \hline\end{array}\)
5234
40835
i. +1244
n. \(+\quad 25034\)
\(\begin{array}{r}4235 \\ \text { e. } \quad 1162 \\ \hline\end{array}\)
41738
j. +38051

\section*{Answers to Exercise Nine}
a. 9695
f. 8568
k. 66798
b. 9949
g. 2576
l. 74898
c. 5889
h. 6887
m. 94724
d. 8998
i. 6478
ก. 65869
e. 5397
j. 79789

If an addition question is written with the numbers side by side, rewrite the question in columns. Put the ones under the ones, the tens under the tens, the hundreds under the hundreds, and so on.

Example E: 263 + 25
\[
\begin{array}{r}
263 \\
+\quad 25 \\
\hline 288
\end{array}
\]

Example F: \(316+9560\)
\[
\begin{array}{r}
316 \\
+\quad 9560 \\
\hline 9876
\end{array}
\]

\section*{Exercise Ten}

Rewrite each question in columns and find the total. Check your work using the answer key at the end of the exercise.
75
4
730
a. +512
d. +275
422
g.
\(\begin{array}{r}+\quad 36 \\ \hline\end{array}\)
372
b. +16
3457
e. +112
24
h. \(\begin{array}{r}333 \\ +\quad 442 \\ \hline\end{array}\)
691
2403
c. +8
f. +340
\(3000 \quad 34511\)
- 24132
j. \(\begin{array}{r}3012 \\ +\quad 40234 \\ \hline\end{array}\)

\section*{Answers to Exercise Ten}
a. 587
b. 388
c. 699
d. 279
e. 3569
f. 2743
g. 1188
h. 799
i. 97666
j. 77757

\section*{Topic A: Self-Test}

Mark /22 Aim 17/22
A. Find the sums. Be sure to check your answers. (6 marks)
63
42
a. +25
d.
33
.
\begin{tabular}{r}
\(+\quad 14\) \\
\hline
\end{tabular}

\section*{.}
b. \(\begin{array}{r}15 \\ +\quad 72\end{array}\)
34
43
4
e.
c. +54
21
f. \(\begin{array}{r}46 \\ +\quad 72 \\ \hline\end{array}\)
B. Find the sums. Be sure to check your answers. (6 marks)
421
375
a. +354
d. \(\begin{array}{r}213 \\ +\quad 611 \\ \hline\end{array}\)

832
b. +162

211

956
351
e.
\(+\quad 515\)
c. +730
731
f.
\begin{tabular}{l}
\(+\quad 312\) \\
\hline
\end{tabular}
C. Find the sums. Be sure to check your answers. (6 marks)
4235
51672
a. +4730
d. +36124
b. \(\begin{array}{r}6513 \\ +\quad 4182 \\ \hline\end{array}\)

25186
e. +4350
8250
c. +3647

42196
f. +70301
D. Add these numbers. (4 marks)
45
242
a.
\(+\quad 32\)
b.
325
\begin{tabular}{l}
\(+\quad 112\) \\
\hline
\end{tabular}
\begin{tabular}{r}
8013 \\
c. \\
1246 \\
\(+\quad 5430\) \\
\hline
\end{tabular}

\section*{Answers to Topic A Self- Test}
A.
a. 88
a. 775
a. 8965
a. 98
b. 87
b. 994
b. 10695
b. 679
c. 97
c. 1686
c. 11897
c. 14689
d. 89
d. 1199
d. 47789
e. 108
f. 139
B.
d. 87796
e. 1077
e. 68689
f. 1288
C.
f. 112497
D.

\section*{Topic B: Addition with Carrying}

When the digits of one column add up to a two digit number (10 or more), you must carry the digit to the next column.


Example B: \(58+76\)
\[
\begin{array}{rrrr}
58 & 1 & 1 & \\
+76 & \mathbf{5 8} & \\
\hline & +76 & +\mathbf{7 6} & \\
\hline
\end{array}
\]

Step 1: Add the one. 8 ones +6 ones \(=14\) ones
Rename the 14 ones as 1 ten and 4 ones.

Write the 4 ones under the ones column and carry the ten to be added with the tens column.
Step 2: Add the tens. 1 ten +5 tens +7 tens \(=13\) tens
The 1 hundred can just be written in the sum because there are no other hundreds to add it to.

\section*{Exercise One}

Find the sums. Check your work using the answer key at the end of the exercise.
62
54
29
a. +18
b. \(\begin{array}{r}46 \\ +\quad 37 \\ \hline\end{array}\)
h. +58
o. +76
68
35
b. +37
i. +49
p. +69
49
66
j. +35
54
c. +42
q. +17
44
99
72
d. +26
k. +88
r. +33
17
89
26
e. +79
1. +74
s. +56
23
37
38
f. +82
m. +15
t. +80
28
g. +91

55
ก. +27

\section*{Answers to Exercise One}
a. 80
b. 83
c. 91
e. 96
f. 105
g. 119
h. 112
i. 117
j. 101
k. 187
l. 163
m. 52
n. 82
o. 105
p. 104
q. 71
r. 105
s. 82
t. 118

\section*{Need some extra practice? Who's the Pig? A Game of Chance.}
- This game is played by two people with one set of dice. Ask your instructor for one set of dice.
- The first player to reach 100 or more points is the winner. Players take turns rolling the dice.
- You add the amounts on the dice to find your score.
- When it is your turn, you may roll as many times in a row as you like. Therefore, it is possible to score 100 or more points in one turn.
- However, during your turn if you roll a 1 on either die, you lose all your points for that turn, and your turn is over.
- If you roll a 1 on both dice, you lose all the points you have, and you have to
- start all over again at zero, and your turn is over.


Step 1: Add the ones. 5 ones +7 ones +9 ones \(=21\) ones

Rename 21 ones as 2 tens and 1 one.
Write the one in the sum under the ones column and carry the 2 tens to the tens column.
Step 2: Add the tens. 2 tens +4 tens +3 tens +6 tens \(=15\) tens
15 tens is 1 hundred and 5 tens.
The one hundred can just be written in the sum because there are no other hundreds to add it to.

\section*{Exercise Two}

Find the sums. Check your work using the answer key at the end of the exercise.
67
63
53
a.
78
\(+\quad 55\)
\(+\quad 1\)
\(\begin{array}{r}\text { f. } \\ +\quad 21 \\ \hline\end{array}\)
k.
60
k.
\(\begin{array}{r}+\quad 71 \\ \hline\end{array}\)
42
b.
\(+\quad 25\)
.
h. \(\begin{array}{r}24 \\ +\quad 89 \\ \hline\end{array}\)
73
1. 24
\begin{tabular}{l}
\(+\quad 51\) \\
\hline
\end{tabular}
31
12
c.
\(+\quad 49\)

23
g. \(\begin{array}{r}18 \\ +\quad 55 \\ \hline\end{array}\)
\(\qquad\)
14
27
d.
\begin{tabular}{l}
\(+\quad 84\) \\
\hline
\end{tabular}
i. \begin{tabular}{l}
\(+\quad 37\) \\
\hline
\end{tabular}
n.
\(+\quad 89\)
41
52
\begin{tabular}{l}
\(+\quad 65\) \\
\hline
\end{tabular}
j.
\begin{tabular}{l}
\(+\quad 47\) \\
\hline
\end{tabular}
22
o.
\(\begin{array}{r}+\quad 64 \\ \hline\end{array}\)

35
p. \(\begin{array}{r}11 \\ +\quad 75 \\ \hline\end{array}\)

27
r. \(\begin{array}{r}51 \\ +\quad 96 \\ \hline\end{array}\)
34
32
q. \(\begin{array}{r}32 \\ +\quad 85 \\ \hline\end{array}\)
25
46
s. +43
v.
41
59
\(\begin{array}{r} \\ +\quad 99 \\ \hline\end{array}\)
36
47
t. \(+\quad 52\)
w.
83
\(+\quad 27\)
31

\section*{Answers to Exercise Two}
a. 200
b. 80
c. 92
d. 134
e. 158
f. 158
g. 120
h. 125
i. 131
j. 132
k. 184
l. 89
m. 146
n. 212
o. 138
p. 121
q. 151
r. 174
s. 114
t. 135
u. 201
v. 199
w. 141
x. 163

Use the same method for carrying when you add the columns of tens, hundreds, thousands, ten thousands, and so on. Look at these examples:


Step 1: Add the ones.
4 ones +8 ones \(=12\) ones \(=1\) ten and 2 ones
Write the 2 ones in the sum. Carry the 1 ten to the tens column.
Step 2: Add the tens.
\(7+3+1\) ten you carried = 11 tens = 1 hundred and 1 ten Write the 1 ten. Carry the 1 hundred to the hundreds column.

Step 3: Add the hundreds.
\(3+4+1\) hundred you carried \(=8\) hundreds. Write 8 .
\begin{tabular}{rr}
4974 & 122 \\
2385 & 4974 \\
+6890 \\
\hline
\end{tabular}\(\quad\)\begin{tabular}{r}
2385 \\
\hline 14249
\end{tabular}

Step 1: Add the ones. 9 ones (write 9 ones in the sum)
Step 2: Add the tens. 24 tens \(=2\) hundreds +4 tens (write 4 tens) Carry the 2 hundreds to the hundreds column.

Step 3: Add the hundreds and the 2 hundreds you carried.
22 hundreds \(=2\) thousands +2 hundreds (write 2 hundreds)
Step 4: Add the thousands and the 2 thousands you carried.
14 thousands \(=1\) ten thousand +4 thousands Write 14 thousands in the sum.


Step 1: Add the ones. 12 ones \(=1\) ten +2 ones Write 2 ones in the sum, carry the 1 ten over.
Step 2: Add the tens. 8 tens
Write 8 tens in the sum, nothing to carry.
Step 3: Add the hundreds. 11 hundreds \(=1\) thousand +1 hundred Write 1 hundred in the sum, carry the 1 thousand.

Step 4: Add the thousands. 10 thousands \(=1\) ten thousand +0 thousands Be sure to write the 0 to hold the thousands place in the sum.
Carry the 1 ten thousand.
Step 5: Add the ten thousands.
12 ten thousands \(=1\) hundred thousand +2 ten thousands
Write the 2 ten thousands in the sum, carry the 1 hundred thousand.
Step 6: Add the hundred thousands.
11 hundred thousands \(=1\) million +1 hundred thousand Write 1 million and the 1 hundred thousand in the sum.

And to read the answer, say, one million, one hundred twenty thousand, one hundred eight-two.

\section*{Exercise Three}

Find the sums. Check your work using the answer key at the end of the exercise.
231
5128
5837
a. +452

520
b. +239

481
c. +306

306
d. +83

5237
e. +2549

2846
f. +1437
1. +1838

2846
n. +1457
h. \(+\quad 239\)

8106
i. +3923

5028
j. +4907
p. +684

2648
k. \(+\quad 273\)
q. +1238

5237
r. +6968

\section*{Answers to Exercise Three}
a. 683
b. 759
c. 787
d. 389
e. 7786
f. 4283
g. 10035
h. 6244
i. 12029
j. 9935
k. 6278
l. 4486
m. 8406
n. 4303
o. 7813
p. 9704
q. 3886
r. 12205

If you are having any problems with this work, ask your instructor to check your method of addition with carrying before you go any further.

If you feel that you need more practice, your instructor will give you more addition questions to do.

\section*{Adding Across}

If an addition question is written with the numbers side by side, rewrite the question in columns. Put the ones under the ones, the tens under the tens, the hundreds under the hundreds, and so on.
\begin{tabular}{|l|}
\hline Example G: \(263+25\) \\
\\
\\
263 \\
\(+\quad 25\) \\
\hline 288 \\
\hline
\end{tabular}

\section*{Example H: 316 + 9560}

316
9560
\(+\quad 986\)
9876

\section*{Exercise Four}

Rewrite each question in columns. Be careful to write ones under ones, tens under tens, hundreds under hundreds, and so on. Check your work using the answer key at the end of the exercise.
a. \(476+392+483=\)
b. \(986+483+524=\)
c. \(3714+3189+4582=\)
d. \(466+5973+821+83=\)
e. \(697+7639+27+5396=\)
f. \(1436+844+16009=\)
g. \(242100+62418+32+528002=\)
h. \(279661+475+49264=\)

\section*{Answers to Exercise Four}
a. 1351
b. 1993
c. 11485
d. 7343
e. 13759
f. 18289
g. 832552
h. 329400

\section*{Topic B: Self-Test}

Mark /15 Aim 12/15
A. Find the sums. Be sure to check your answers. (12 marks)


\section*{7834}
e. +2169
B. Add these numbers. (3 marks)
a. \(74+32+67+85=\)
b. \(721+8462+968+99=\)

\section*{c. \(389+2517+2=\)}

\section*{Answers to Topic B Self-Test}
A.
a. 142 e. 10003
a. 258
b. 142
b. 10250
c. 1725
c. 2908
d. 1132
f. 8057
g. 133442
h. 81000
k. 1505236
l. 82383
B.

\section*{Topic C: Estimating Answers in Addition}

You have learned how to round numbers. Now you can use that skill to quickly find an approximate sum.

Often an estimate is all you need. If you are going away for the weekend, you have to think about how much money you will need.

The hotel is about \(\$ 60\), meals about \(\$ 80\), gas about \(\$ 40\), and entertainment about \(\$ 100\). You will take \(\$ 60+\$ 80+\$ 40+\$ 100=\$ 280\)

When you are solving word problems or working with a calculator, you should estimate your answer first so you can tell if your answer is sensible.

In these examples, estimate the answer. Round each number BEFORE you add.

```

    43928 rounds to 40000
    29785 rounds to 30000
    88319 rounds to 90000
    + 243928 rounds to + 240000
400000

```

If you are estimating an answer, usually you estimate to the largest place value that you can. Your estimate will give you what is sometimes called a ballpark figure. You will have an approximate answer.

\section*{Exercise One}

Estimate the sums. Check your work using the answer key at the end of the exercise.
\begin{tabular}{|c|c|c|c|c|c|c|c|c|}
\hline \multirow[b]{3}{*}{a.} & & 973 & \(\approx\) & & 1000 & \multirow{4}{*}{d.} & \multirow{4}{*}{\(+\)} & \multirow[t]{3}{*}{\[
\begin{aligned}
& 3519 \\
& 4003 \\
& 3832 \\
& \hline
\end{aligned}
\]} \\
\hline & & 496 & \(\approx\) & & 500 & & & \\
\hline & \(+\) & 382 & \(\approx\) & \(+\) & 400 & & & \\
\hline \multirow{4}{*}{b.} & & & & & 1900 & & & \\
\hline & & 519 & & & & \multirow{3}{*}{e.} & \multirow[b]{3}{*}{\(+\)} & 2727 \\
\hline & & 439 & & & & & & 2329 \\
\hline & + & 382 & & & & & & 9818 \\
\hline & & 1234 & & & & \multirow{3}{*}{f.} & & 4113 \\
\hline c. & & 4567 & & & & & & 1590 \\
\hline c. & + & 7890 & & & & & \(+\) & 2671 \\
\hline
\end{tabular}

38985
43691
g. \begin{tabular}{l}
\(+\quad 8336\) \\
\hline
\end{tabular}

42163
30820
h. 21911
\[
+\quad 60422
\]

21472
46371
i.

98393
\(\begin{array}{r} \\ +\quad 82218 \\ \hline\end{array}\)

30706
29115
j. \(\quad 40082\)
\(+\quad 31621\)

431391
554423
k. \(\quad 913174\)
\(\begin{array}{r}282826 \\ \hline\end{array}\)

171234
102085
l. 460892
\(\begin{array}{r} \\ +\quad 542329 \\ \hline\end{array}\)

\section*{Answers to Exercise One}
a. \(1000+500+400=1900\)
b. \(500+400+400=1300\)
c. \(1000+5000+8000=14000\)
d. \(4000+4000+4000=12000\)
e. \(3000+2000+10000=15000\)
f. \(4000+2000+3000=9000\)
g. \(39000+44000+8000=91000\)
h. \(40000+30000+20000+60000=150000\)
i. \(20000+50000+100000+80000=250000\)
j. \(30000+30000+40000+30000=130000\)
k. \(400000+600000+900000+300000=2200000\)
l. \(200000+100000+500000=1300000\)

\section*{Estimating Answers in Addition Word Problems}

When you are solving word problems, an estimate tells you if your answer is sensible. You can use
your estimate to help you check your answers. If your answer and the estimate are not close, then you know that you should add your numbers again.

Exercise Two

Estimate the following answers. Be sure to round to the largest place value possible before adding. Remember to circle the information and underline what is being asked. Check your work using the answer key at the end of the exercise.

\section*{Example:}

During one month, Chaska spends 11432 minutes sleeping and 5812 minutes eating. Estimate how much time he spends sleeping and eating.
During one month, Chaska spends 11432 minutes sleeping and 5812 minutes eating. Estimate how much time he spends sleeping and eating.
\(11432+5812\)

\section*{Estimate:}
\(11000+6000=17000\)
Chaska spent about 17000 minutes sleeping and eating.
a. During October, Amul drove 674 kilometres, 493 kilometres, 384 kilometres and 914 kilometres. Estimate the total kilometres Amul drove.
b. The number of passengers using the ABE Taxi Company for the past three weeks were 3205 passengers, 3542 passengers and 2821 passengers. Estimate the number of passengers that used the ABE Taxi Company.
c. In 2008, the top three winning teams in the NHL were the Montreal Canadiens winning 2980 games, the Boston Bruins winning 2669 games and the Toronto Maple Leafs winning 2535 games. Estimate the total number of games won by these three teams.
d. The three deepest lakes in the world are Baikal Lake which is 1741 metres, Tanganyika Lake which is 1471 metres and the Caspian Sea which 1025 metres. Estimate the total depth of the three lakes.

\section*{Answers to Exercise Two}
a. \(700+500+400+900=2500\) kilometres
b. \(3000+4000+3000=10000\) passengers
c. \(3000+3000+3000=9000\) games
d. \(2000+1000+1000=4000\) metres

\section*{Topic C: Self-Test}

\section*{Mark /15 Aim 11/15}
A. Estimate the sums. Show your work. (9 marks)

B. Estimate each of the following word problems. (6 marks) Be sure to include the unit of measure in your answer. (2 marks each)
Be sure to circle information and underline what is being asked.
a. Yuan counted 854 old books and 519 new books. Estimate how many books there were altogether.
b. A magazine has 34783 subscribers. Last year the magazine had 26876
subscribers. Estimate how many subscribers in total.
c. The area of Canada is 9984670 square kilometres. The area of the United States is 9629091 square kilometres. The area of Mexico is 1964375 square kilometres. Estimate the total area of the three countries.

\section*{Answers to Topic C Self-Test}
A.
a. 18000
a. 1400 books
b. 28000
b. 60000 subscribers
c. 13000
c. 22000000 square kilometres
d. 955000
e. 619000
f. 553000
g. 2300000
h. 13000000
i. 3800000
B.

\section*{Unit 2 Review: Addition}

You will now practice all the skills you learned in Unit 2. Check your work using the answer key at the end of the review
A. Find the sums.
23
62
64
a. +35
c. +36
e. \(+\quad 14\)
47
b. +52
51
d. +24
f. +32
53

B. Find the sums.
41
c.
58
58
\begin{tabular}{l}
\(+\quad 20\) \\
\hline
\end{tabular}
23
a.
34
\begin{tabular}{l}
\(+\quad 42\) \\
\hline
\end{tabular}
22
e.
46
\begin{tabular}{l}
\(+\quad 31\) \\
\hline
\end{tabular}
42
35
b.
\begin{tabular}{l}
\(+\quad 70\) \\
\hline
\end{tabular}
51
d.
43
\begin{tabular}{l}
\(+\quad 70\) \\
\hline
\end{tabular}
63
f.
24

C. Find the sums.
\(\begin{array}{r}518 \\ \text { a. } \quad+\quad 470 \\ \hline\end{array}\)
820
c. \(+\quad 149\)
240
a. \(+\quad 470\)
b. \(\begin{array}{r}410 \\ +\quad 316 \\ \hline\end{array}\)
631
723
d. \(+\quad 235\)
f. +126
D. Find the sums.
453
212
c. \(+\quad 831\)
216
a.
\(\begin{array}{r}+\quad 320 \\ \hline\end{array}\)
542
e. 315
\(\qquad\) \(\begin{array}{r} \\ +\quad 641 \\ \hline\end{array}\)
231
425
b.
\(\begin{array}{r}+\quad 313 \\ \hline\end{array}\)
726
d. \(\begin{array}{r}+\quad 443 \\ \hline\end{array}\)

E. Find the sums.
3168
7521
54373
a. +3220
c. +3167
e. +54625
b. \(\begin{array}{r}3782 \\ +\quad 4217 \\ \hline\end{array}\)
d. \(\begin{array}{r}52163 \\ +\quad 72835 \\ \hline\end{array}\)
83245
f. +13450
F. Find the sums.
a. \(45+104\)
b. \(523+364\)
c. \(5231+346\)
d. \(4661+2138\)
e. \(42+707+350\)
f. \(63613+45165\)
g. \(22514+43262+21102\)
h. \(72510+4127+13041\)
G. Find the sums.
96
87
35
b. +57
c. +89
48
d. +63
H. Find the sums.
27
a. \(\begin{array}{r}18 \\ +\quad 35 \\ \hline\end{array}\)
\(\begin{array}{r}18 \\ +\quad 35 \\ \hline\end{array}\)
52
16
b.
\(\begin{array}{r}16 \\ +\quad 79 \\ \hline\end{array}\)
58
37
C.
\(\begin{array}{r}+\quad 29 \\ \hline\end{array}\)
\(\qquad\)
d. \(\begin{array}{r}59 \\ +\quad 26 \\ \hline\end{array}\)
42
36
e.
\(\qquad\)
36
\(\begin{array}{r}84 \\ \text { f. } \quad 57 \\ \hline\end{array}\)
54
e. +98
f. \(\begin{array}{r}37 \\ +\quad 65 \\ \hline\end{array}\)
I. Find the sums.
\begin{tabular}{|c|c|c|c|c|c|c|c|c|}
\hline \multirow{3}{*}{a.} & & 527 & \multirow{3}{*}{e.} & & 83245 & \multirow[b]{3}{*}{h.} & & 483 \\
\hline & \(+\) & 319 & & + & 13876 & & & 629 \\
\hline & & & & & & & \(+\) & 753 \\
\hline \multirow{3}{*}{b.} & & 382 & \multirow{3}{*}{f.} & & 52368 & \multirow{6}{*}{i.} & & \\
\hline & \(+\) & 476 & & + & 29240 & & & 4216 \\
\hline & & & & & & & & 3807 \\
\hline \multirow{3}{*}{c.} & & 3782 & \multirow{5}{*}{g.} & & 683 & & \(+\) & 4498 \\
\hline & \(+\) & 4561 & & & 194 & & & \\
\hline & & & & + & 276 & & & 11615 \\
\hline & & 6789 & & & & \multirow[t]{2}{*}{j.} & & 12573 \\
\hline d. & \(+\) & 4567 & & & & & \(+\) & 76125 \\
\hline
\end{tabular}
321456
523214
\begin{tabular}{l}
\(+\quad 212304\) \\
\hline
\end{tabular}
12421
1. 6815 \begin{tabular}{l}
\(+\quad 42916\) \\
\hline
\end{tabular}
J. Find the sums.
a. \(234+357+526=\)
b. \(435+16+127=\)
c. \(4118+2671+1590=\)
d. \(67543+17069=\)
e. \(4235+6815+42916=\)
f. \(231262+64221+7143=\)
K. Estimate the sums.
217
31945
d.
\(+\quad 3142\)

\begin{tabular}{l}
\(+\quad 3142\) \\
\hline
\end{tabular}
3317
b.
\(+\quad 1212\)
2154
316
a.
\(\begin{array}{r}+\quad 142 \\ \hline\end{array}\)
41730
2151
e. 33225
\begin{tabular}{r}
\(+\quad 14659\) \\
\hline
\end{tabular}
2173317
f.
3621154
\(\begin{array}{r} \\ +\quad 1421212 \\ \hline\end{array}\)
21016
c.
            \(\begin{array}{r} \\ +\quad 51202 \\ \hline\end{array}\)
L. Estimate the following answers. be sure to round to the largest place value possible before adding. remember to circle the information and underline what is being asked.
a. The Plumbers' Union has 456 members. The Carpenters' Union has 875 members. The Electricians' Union has 1394 members. Estimate how many members these three unions have.
b. Last year Seung shipped 42169 orders from his warehouse. So far this year, Seung has shipped 5837 orders. Estimate the total number of orders sent.
c. Avani has driven 42576 kilometres, 38342 kilometres and 14208 kilometres in the last three years. Estimate how many kilometres Avani has driven in the last three years.

\section*{Answers to Unit 2 Review}
A.
a. 58
a. 99
a. 988
a. 989
a. 6388
a. 149
b. 99
b. 147
b. 726
b. 969
b. 7999
b. 887
c. 98
c. 119
c. 969
c. 1388
c. 10688
c. 5577
d. 75
d. 164
d. 866
d. 1299
d. 124998
e. 78
e. 99
e. 763
e. 1498
e. 108998
e. 1099
f. 85
B.
f. 168
C.
d. 6799
f. 849
D.
f. 1189
E.
f. 96695
F.
f. 108778
g. 86878
h. 89678
G.
a. 154
b. 144
c. 124
d. 111
e. 152
f. 102
H.
a. 80
b. 147
c. 124
d. 127
e. 177
f. 111
I.
a. 846
e. 97121
i. 12521
b. 858
f. 81608
j. 100313
c. 8343
g. 1153
k. 1056974
d. 11356
h. 1865
l. 62152
J.
a. 1117
b. 578
c. 8379
d. 84612
e. 53966
f. 302626
K.
a. \(200+300+100=600\)
b. \(3000+2000+1000=6000\)
c. \(20000+10000+50000=80000\)
d. \(32000+12000+3000=47000\)
e. \(42000+2000+33000+15000=92000\)
f. \(2000000+4000000+1000000=7000000\)
L.
a. \(500+900+1400=2800\) members
b. \(42000+6000=48000\) orders
c. \(40000+40000+10000=90000\) kilometers

CONGRATULATIONS!!
Now you have finished Unit 2.

TEST TIME!
Ask your instructor for the Practice Test for this unit.
Once you've done the practice test, you need to do the unit 2 test.
Again, ask your instructor for this.
Good luck!

\section*{Unit 3: Subtraction}

\section*{Topic A: Subtraction}

Subtraction takes an amount away from another amount. The result of subtraction is called the difference.

The minus sign - means to subtract.


This says nine minus three equals six or nine take away three is six. The difference between 9 and 3 is 6.

Subtraction is the opposite of addition. Look at the examples:
\begin{tabular}{|l|l|}
\hline Addition & Subtraction \\
\hline \(5+4=9\) & \(9-4=5\) \\
\hline \(4+5=9\) & \(9-5=4\) \\
\hline 8 \\
\(+\quad 3\) \\
\hline 11 & \begin{tabular}{l}
11 \\
-3 \\
\(+\quad 8\)
\end{tabular} \\
\hline 11
\end{tabular}

Subtraction facts are a tool that you use to do subtraction questions.

\section*{Exercise One}

Check out your subtraction facts by doing this exercise as quickly as you can. Then, make a list of any subtraction facts you do not know or are tricky for you - practice them.
5
11
9
a. -2
g. \(\quad-\quad 9\)
m. -0
9
7
b. \(\quad-1\)
h. -7
n. -8
c. \(\begin{array}{r}12 \\ -\quad 4 \\ \hline\end{array}\)
i. \(\quad-\quad 6\)
16
15
d. -2
j. -9
p. -8
17
e. -9
k. -3
f. \(\begin{array}{r}2 \\ -\quad 1 \\ \hline\end{array}\) 8
1. -1

\section*{Answers to Exercise One}
a. 3
b. 8
c. 8
d. 2
e. 8
f. 1
g. 2
h. 0
i. 8
j. 7
k. 6
l. 7
m. 9
n. 6
o. 5
p. 7

Note: There is no self-test for this topic.

\section*{Topic B: Subtraction of Larger Numbers}

You can find the difference between two large numbers using the subtraction facts you have been practicing. Always take away or subtract the number after the minus sign.

Use these steps to complete each subtraction question.
- Step 1: Subtract the ones from the ones.
- Step 2: Subtract the tens from the tens.
- Step 3: Subtract the hundreds from the hundreds.
- Step 4: Subtract the thousands from the thousands.
- Step 5: Subtract the ten thousands from the ten thousands and so on.

Example A: 57-26

Step 1: Subtract the ones from the ones. 7 ones -6 ones \(=1\) one, write the answer in line with the ones in the question.
\[
\begin{array}{r}
57 \\
-\quad 26 \\
\hline 1
\end{array}
\]

Step 2: Subtract the tens from the tens. 5 tens -2 tens \(=3\) tens
The difference between 57 and 26 is 31 .
57
\(\begin{array}{r}-\quad 26 \\ \hline 31\end{array}\)

\section*{Exercise One}

Find the differences. Check your work using the answer key at the end of the exercise.
36
a. -13
64
i. -21
q. \(\quad-\quad 40\)
b. \(\begin{array}{r}72 \\ -\quad 42 \\ \hline\end{array}\)
55
j. -64
48
c. \(\quad-\quad 22\)
k. \(\quad 73\)
98
c. \(-\quad 22\)
1. -64
\(\begin{array}{r}93 \\ \text { e. } \quad-\quad 40 \\ \hline\end{array}\)
86
m. \(\quad-\quad 50\)
t. -80
d. -31
40
u. \(-\quad 29\)
76
f. -71
\(\begin{array}{r}95 \\ \text { g. } \quad-\quad 62 \\ \hline\end{array}\)
\(\begin{array}{r}28 \\ \text { о. } \quad-\quad 17 \\ \hline\end{array}\)
48
39
69
9
p. -52
x. -40

\section*{Answers Exercise One}
a. 23
b. 30
c. 26
d. 24
e. 53
f. 5
g. 33
h. 13
i. 43
j. 21
k. 25
l. 12
m. 36
n. 60
o. 11
p. 17
q. 44
r. 21
s. 14
t. 9
u. 50
v. 9
w. 6
x. 8

\section*{Checking Subtraction}

You can check your subtraction. Add the answer (the difference) to the number you took away (the second number). If your subtracting was correct, the result of the adding will be the number you started with (the top number) in the subtraction question.

Example B

928
The difference is \(\quad-\quad 416\)
512
To check, add 512 to 416.
\[
\begin{array}{r}
512 \\
+\quad 416 \\
\hline 928
\end{array}
\]

\section*{Exercise Two}

Find the differences. Check your work by adding and then by using the answer key at the end of the exercise.
87
29
48
a. -36
b. -21
c. \(\quad-\quad 40\)
99
d. -63
75
1. \(\begin{array}{r}49 \\ -\quad 19 \\ \hline\end{array}\)
73
f. -20
\(\begin{array}{r}92 \\ \text { g. } \quad-\quad 21 \\ \hline\end{array}\)
58
h. \(\quad-\quad 27\)
84
i. -23
69
j. -38
q. \(\quad-\quad 75\)
\begin{tabular}{l}
96 \\
75 \\
\hline
\end{tabular}
p. \(\quad-\quad 44\)
w. -53
v. \(\quad-\quad 12\)
o. -15
-

v. 15
w. 21
x. 25

Example C: 696-251 =

Use these steps to complete each subtraction question.
Step 1: Subtract the ones from the ones. 6 ones -1 one \(=5\) ones
696
- 251

5
Step 2: Subtract the tens from the tens. 9 tens - 5 tens \(=4\) tens
696
- 251

45
Step 3: Subtract the hundreds from the hundreds.
6 hundreds -2 hundreds \(=4\) hundreds
696
- 251

445
The difference between 696 and 251 is 445 .

\section*{Exercise Three}

Find the differences. Check your work using the answer key at the end of the exercise.
995
877
788
a. -452
b. \(\quad-\quad 342\)
c. -615
987
d. -243
549
e. -131
\(\begin{array}{r}806 \\ \text { f. } \quad-\quad 204 \\ \hline\end{array}\)
\(\begin{array}{r}953 \\ \text { g. } \quad-\quad 603 \\ \hline\end{array}\)
569
h. -403

\[
\begin{array}{r}
269 \\
\text { j. } \quad-\quad 159 \\
\hline
\end{array}
\]
q. \(\quad-\quad 410\)
837
o. \(\quad-\quad 810\)
957
p. \(\quad-342\)
w. \(\quad 224\)
v. \(\quad-163\)
,
u. -246
175
t. -523
849
963
s. -120
1. -270
\(\begin{array}{r} \\ \text { m. } \\ 796 \\ -\quad 172 \\ \hline\end{array}\)
\(\begin{array}{r} \\ \text { m. } \\ 796 \\ -\quad 172 \\ \hline\end{array}\)
r. -208
-
549
n. \(\quad-\quad 531\)
864
-
-
-
875
x. \(\quad-\quad 252\)

\section*{Answers to Exercise Three}
a. 543
b. 535
c. 173
d. 744
e. 418
f. 602
g. 350
h. 166
i. 224
j. 110
k. 282
l. 111
m. 624
n. 333
o. 153
p. 615
q. 427
r. 320
s. 429
t. 104
u. 603
v. 12
w. 713
x. 623

Exercise Four

Find the differences. Check your work using the answer key at the end of the exercise.
543
587
964
a. \(\quad-\quad 132\)
e. -425
i. \(\quad-\quad 231\)
752
857
679
b. \(\quad-\quad 150\)
f. -143
j. \(\quad-\quad 424\)
328
545
757
c. \(\quad-115\)
g. \(\quad-\quad 302\)
k. \(\quad-\quad 136\)
758
466
467
d. -341
h. \(\quad-115\)
l. -132

\section*{Answers to Exercise Four}
a. 411
b. 602
c. 213
d. 417
e. 162
f. 714
g. 243
h. 351
i. 733
j. 255
k. 621
l. 335

Use these steps to complete each subtraction question:

Step 1: Subtract the ones from the ones. 8 ones -4 ones \(=4\) ones
4628
\(-\quad 2604\)
4
Step 2: Subtract the tens from the tens. 2 tens -0 tens \(=2\) tens
4628
2604
\(-\quad 24\)
Step 3: Subtract the hundreds from the hundreds.
6 hundreds -6 hundreds \(=0\) hundreds
\[
\begin{array}{r}
4628 \\
-\quad 2604 \\
\hline 024
\end{array}
\]

The 0 must be placed in the answer to hold the hundreds place.
Step 4: Subtract the thousands from the thousands.
4 thousands -2 thousands \(=2\) thousands
\[
\begin{array}{r}
4628 \\
-\quad 2604 \\
\hline 2024
\end{array}
\]

The difference between 4628 and 2604 is 2024 .
```

Example E: 79 486-42 104 =

```

Step 1: Subtract the ones from the ones. 6 ones -4 ones \(=2\) ones
\[
\begin{array}{r}
79486 \\
-\quad 42104 \\
\hline 2
\end{array}
\]

Step 2: Subtract the tens from the tens. 8 tens -0 tens \(=8\) tens
79486
- 42104 82

Step 3: Subtract the hundreds from the hundreds.
4 hundreds - 1 hundreds = 3 hundreds
79486
42104
\(-\quad 382\)
Step 4: Subtract the thousands from the thousands.
9 thousands -2 thousands \(=7\) thousands
79486
- 42104

7382
Step 5: Subtract the ten thousands from the ten thousands.
7 ten thousands -4 ten thousands \(=3\) ten thousands
79486
\(\begin{array}{r}-\quad 42104 \\ \hline 37382\end{array}\)
The difference between 79486 and 42104 is 37382 .

\section*{Exercise Five}

8646
a. \(\quad-\quad 542\)

7295
b. -231

9738
c. -215
6498
d. -253
8954
7638
i. \(\quad-\quad 2151\)
ก. \(\quad-\quad 6218\)
3674
8975
4759
e. -2503
j. -4732
o. \(\quad-\quad 1136\)
3219
f. \(\quad-\quad 2116\)
7296
8275
k. \(\quad-\quad 5081\)
p. \(\quad-\quad 4073\)
6456
g. \(\quad-\quad 5234\)
9678
1. -4316
1758
9489
h. \(\quad-\quad 1431\)
m. \(\quad-\quad 2079\)

\section*{Answers to Exercise Five}
a. 8104
b. 7064
c. 9523
d. 6245
e. 1171
f. 1103
g. 1222
h. 327
i. 6803
j. 4243
k. 2215
l. 5362
m. 7410
n. 1420
o. 3623
p. 4202

If a subtraction question is written with the numbers side by side, rewrite the question in columns. Put the ones under the ones, the tens under the tens, the hundreds under the hundreds, and so on. The first number is always the top number and the second number is always written below the first number.
```

Example F: 687-52 =

```
```

Example G: 9 756-420=

```

9756
- 420

9336

\section*{Exercise Six}

Rewrite each question in columns and find the differences. Check your work using the answer key at the end of the exercise.
43
779
965
a. -21
d. -54
g. -152
84
695
849
b. \(\quad-\quad 30\)
e. -173
h. -212
\(\begin{array}{r}975 \\ \text { c. } \quad-\quad 21 \\ \hline\end{array}\)
863
f. \(\quad 701\)

\section*{Answers to Exercise Six}
a. 22
b. 54
d. 725
e. 522
g. 813
h. 637

\section*{Topic B: Self-Test}

\section*{Mark /24 Aim 19/24}
A. Find the differences. Be sure to check your answers. (6 marks.)
39
72
64
a. \(\quad-15\)
c. \(\quad-60\)
e. \(\quad-\quad 10\)
58
49
85
b. \(\quad-\quad 24\)
d. -23
f. -71
B. Find the differences. Be sure to check your answers. (6 marks)
896
399
752
a. -385
c. \(\quad 202\)
e. -231
698
467
497
b. -461
d. \(\quad-\quad 124\)
f. \(\quad-\quad 341\)
C. Find the differences. Be sure to check your answers. (6 marks)
8627
9751
37698
a. \(\quad-\quad 323\)
c. \(\quad-\quad 7340\)
e. \(-\quad 12540\)
9875
34859
96723
b. \(\quad-\quad 9251\)
d. -1336
f. \(\quad-\quad 51403\)
D. Subtract these numbers. (6 marks)
a. \(85-61=\)
b. \(724-13=\)
c. \(879-152=\)
d. \(4957-821=\)
e. \(94658-12307=\)
f. \(89653-27450=\)

\section*{Answers to Topic B Self-Test}
A.
a. 24
a. 511
a. 8304
a. 24
b. 34
b. 237
b. 624
b. 711
c. 12
c. 197
c. 2411
c. 727
d. 26
d. 343
d. 33523
d. 4136
e. 54
e. 521
e. 25158
e. 82351
f. 14
B.
f. 156
C.
f. 45320
D.
f. 62203

\section*{Topic C: Renaming}

When you subtract, you may need to rename. Renaming means changing from one place value to another.

For example:
- 1 ten can be renamed as 10 ones
- 1 hundred can be renamed as 10 tens
- 1 thousand can be renamed as 10 hundreds.

Renaming is an important part of subtracting. Sometimes the digit on top is smaller than the digit you are subtracting. This means that you will have to rename before you can subtract. This is also called borrowing.

Example A: 293

2 hundreds, 9 tens, 3 ones
renamed 2 hundreds, 8 tens, 13 ones
You borrow 1 ten. The 1 ten is renamed as 10 ones.
10 ones +3 ones \(=13\) ones

\section*{Example B: 3782}

3 thousands, 7 hundreds, 8 tens, 2 ones
Renamed 3 thousands, 6 hundreds, 18 tens, 2 ones
You borrow 1 hundred. The 1 hundred is renamed as 10 tens.
10 tens +8 tens \(=18\) tens

Borrow from the number in the shaded box. Check your work using the answer key at the end of the exercise.
a.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & ten thousands & thousands & hundreds & tens & ones \\
\hline 423 & & & 4 & 2 & 3 \\
\hline & & & 4 & 1 & 13 \\
\hline
\end{tabular}
b.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & ten thousands & thousands & hundreds & tens & ones \\
\hline 642 & & & & & \\
\hline & & & & & \\
\hline
\end{tabular}
c.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & ten thousands & thousands & hundreds & tens & ones \\
\hline 1456 & & & & & \\
\hline & & & & & \\
\hline
\end{tabular}
d.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & ten thousands & thousands & hundreds & tens & ones \\
\hline 5423 & & & & & \\
\hline & & & & & \\
\hline
\end{tabular}
e.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & ten thousands & thousands & hundreds & tens & ones \\
\hline 6384 & & & & & \\
\hline & & & & & \\
\hline
\end{tabular}

\section*{Answers to Exercise One}
b.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & ten thousands & thousands & hundreds & tens & ones \\
\hline \(\mathbf{6 4 2}\) & & & 6 & 4 & 2 \\
\hline & & & 6 & 3 & \(\mathbf{1 2}\) \\
\hline
\end{tabular}
c.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & ten thousands & thousands & hundreds & tens & ones \\
\hline \(\mathbf{1 4 5 6}\) & & 1 & 4 & 5 & 6 \\
\hline & & 1 & 4 & \(\mathbf{4}\) & \(\mathbf{1 6}\) \\
\hline
\end{tabular}
d.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & ten thousands & thousands & hundreds & tens & ones \\
\hline \(\mathbf{5 4 2 3}\) & & 5 & 4 & 2 & 3 \\
\hline & & 5 & 4 & 1 & \(\mathbf{1 3}\) \\
\hline
\end{tabular}
e.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & ten thousands & thousands & hundreds & tens & ones \\
\hline \(\mathbf{6 3 8 4}\) & & 6 & 3 & 8 & 4 \\
\hline & & 6 & 2 & \(\mathbf{1 8}\) & 4 \\
\hline
\end{tabular}

Sometimes there is a zero in the place where you want to borrow from. You will need to move one more place value to the left and borrow from there.

Example C: 203

2 hundreds, 0 tens, 3 ones
renamed \(\mathbf{1}\) hundreds, 10 tens, 3 ones
You borrow 1 hundred. The 1 hundred is renamed as 10 tens.
1 hundred, 9 tens, 13 ones
Then, you borrow 1 ten. The 1 ten is renamed as 10 ones.
10 ones +3 ones \(=13\) ones

Example D: 30782

3 ten thousands, 0 thousands, 7 hundreds, 8 tens, 2 ones
renamed 2 ten thousands, 10 thousands, 7 hundreds, 8 tens,
2 ones

You borrow 1 ten thousand. The 1 ten thousand is renamed as 10 thousands.
2 ten thousands, 9 thousands, 17 hundreds, 8 tens, 2 ones Then, you borrow 1 thousand. The 1 thousand is renamed as 10 hundreds.

10 hundreds +7 hundreds \(=17\) hundreds

\section*{Exercise Two}

Borrow from the number in the shaded box. Check your work using the answer key at the end of the exercise.
a.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & ten thousands & thousands & hundreds & tens & ones \\
\hline 403 & & & 4 & 0 & 3 \\
\hline & & & 3 & 10 & 3 \\
\hline & & & 3 & 9 & 13 \\
\hline
\end{tabular}
b.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & ten thousands & thousands & hundreds & tens & ones \\
\hline 501 & & & & & \\
\hline & & & & & \\
\hline & & & & & \\
\hline
\end{tabular}
c.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & ten thousands & thousands & hundreds & tens & ones \\
\hline 904 & & & & & \\
\hline & & & & & \\
\hline & & & & & \\
\hline
\end{tabular}
d.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & ten thousands & thousands & hundreds & tens & ones \\
\hline 307 & & & & & \\
\hline & & & & & \\
\hline & & & & & \\
\hline
\end{tabular}

\section*{Answers to Exercise Two}
a.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & ten thousands & thousands & hundreds & tens & ones \\
\hline 403 & & & 4 & 0 & 3 \\
\hline & & & 3 & 10 & 3 \\
\hline & & & 3 & 9 & 13 \\
\hline
\end{tabular}
b.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & ten thousands & thousands & hundreds & tens & ones \\
\hline 501 & & & 5 & 0 & 1 \\
\hline & & & 4 & \(\mathbf{1 0}\) & 1 \\
\hline & & & 4 & \(\mathbf{9}\) & \(\mathbf{1 1}\) \\
\hline
\end{tabular}
c.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & ten thousands & thousands & hundreds & tens & ones \\
\hline 904 & & & 9 & 0 & 4 \\
\hline & & & 8 & 10 & 4 \\
\hline & & & 8 & 9 & 14 \\
\hline
\end{tabular}
d.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & ten thousands & thousands & hundreds & tens & ones \\
\hline 307 & & & 3 & 0 & 7 \\
\hline & & & 2 & 10 & 7 \\
\hline & & & 8 & 9 & 14 \\
\hline
\end{tabular}

Need more practice?
Ask your instructor for some play money. Using the one, ten, hundred, thousand, ten thousand and hundred thousand dollar bills, practice trading one of one type of bill for ten of the lesser place value.

Example:
\begin{tabular}{|c|c|c|c|}
\hline \begin{tabular}{l}
ABE bucks \\
\$10 \\
Ten
\end{tabular} & \(=\) & \begin{tabular}{l}
ABE bucks \\
\$1 \\
One
\end{tabular} & \begin{tabular}{l}
ABE bucks \\
\$1 \\
One
\end{tabular} \\
\hline \begin{tabular}{l}
ABE bucks \\
\$1 \\
One
\end{tabular} & & \begin{tabular}{l}
ABE bucks \\
\$1 \\
One
\end{tabular} & \begin{tabular}{l}
ABE bucks \\
\$1 \\
One
\end{tabular} \\
\hline \begin{tabular}{l}
ABE bucks \\
\$1 \\
One
\end{tabular} & & \begin{tabular}{l}
ABE bucks \\
\$1 \\
One
\end{tabular} & \begin{tabular}{l}
ABE bucks \\
\$1 \\
One
\end{tabular} \\
\hline \begin{tabular}{l}
ABE bucks \\
\$1 \\
One
\end{tabular} & & \begin{tabular}{l}
ABE bucks \\
\$1 \\
One
\end{tabular} & \\
\hline & & \begin{tabular}{l}
ABE bucks \\
\$1 \\
One
\end{tabular} & \\
\hline & & \begin{tabular}{l}
ABE bucks \\
\$1 \\
One
\end{tabular} & \\
\hline & & \begin{tabular}{l}
ABE bucks \\
\$1 \\
One
\end{tabular} & \\
\hline & & \begin{tabular}{l}
ABE bucks \\
\$1 \\
One
\end{tabular} & \\
\hline & & \begin{tabular}{l}
ABE bucks \\
\$1 \\
One
\end{tabular} & \\
\hline
\end{tabular}
\begin{tabular}{|l|l|l|l|}
\hline & \begin{tabular}{l} 
ABE bucks \\
\(\$ 1\) \\
One
\end{tabular} & \\
\hline
\end{tabular}

\section*{Topic C: Self-Test}

\section*{Mark /12 Aim 10/12}
A. Borrow from the number in the shaded box. (6 marks)
a.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 783 & & & & & \\
\hline & & & & & \\
\hline
\end{tabular}
b.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 827 & & & & & \\
\hline & & & & & \\
\hline
\end{tabular}
c.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 7942 & & & & & \\
\hline & & & & & \\
\hline
\end{tabular}
d.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 5364 & & & & & \\
\hline & & & & & \\
\hline
\end{tabular}
e.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 28634 & & & & & \\
\hline & & & & & \\
\hline
\end{tabular}
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 62751 & & & & & \\
\hline & & & & & \\
\hline
\end{tabular}
B. Borrow from the number in the shaded box. 6 marks.
a.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 602 & & & & & \\
\hline & & & & & \\
\hline & & & & & \\
\hline
\end{tabular}
b.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 805 & & & & & \\
\hline & & & & & \\
\hline & & & & & \\
\hline
\end{tabular}
c.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 3075 & & & & & \\
\hline & & & & & \\
\hline & & & & & \\
\hline
\end{tabular}
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 7048 & & & & & \\
\hline & & & & & \\
\hline & & & & & \\
\hline
\end{tabular}
e.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 30478 & & & & & \\
\hline & & & & & \\
\hline & & & & & \\
\hline
\end{tabular}
f.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 80946 & & & & & \\
\hline & & & & & \\
\hline & & & & & \\
\hline
\end{tabular}

\section*{Answers to Topic C Self-Test}
A.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 783 & & & 7 & 8 & 3 \\
\hline & & & 7 & 7 & 13 \\
\hline
\end{tabular}
b.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 827 & & & 8 & 2 & 7 \\
\hline & & & 8 & 1 & 17 \\
\hline
\end{tabular}
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 7942 & & 7 & 9 & 4 & 2 \\
\hline & & 7 & 8 & 14 & 2 \\
\hline
\end{tabular}
d.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 5364 & & 5 & 3 & 6 & 4 \\
\hline & & 5 & 2 & 16 & 4 \\
\hline
\end{tabular}
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 28634 & 2 & 8 & 6 & 3 & 4 \\
\hline & 2 & 7 & 16 & 3 & 4 \\
\hline
\end{tabular}
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline \(\mathbf{6 2 7 5 1}\) & 6 & 2 & 7 & 5 & 1 \\
\hline & 6 & \(\mathbf{1}\) & \(\mathbf{1 7}\) & 6 & 1 \\
\hline
\end{tabular}
B.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 602 & & & 6 & 0 & 2 \\
\hline & & & 5 & 10 & 2 \\
\hline & & 5 & 9 & 12 \\
\hline
\end{tabular}
b.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 805 & & & 8 & 0 & 5 \\
\hline & & & 7 & 10 & 5 \\
\hline & & & 7 & 9 & 12 \\
\hline
\end{tabular}
\begin{tabular}{|l|l|l|l|l|l|}
\hline C. & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline \(\mathbf{3 0 7 5}\) & & 3 & 0 & 7 & 5 \\
\hline & & 2 & 10 & 7 & 5 \\
\hline & & 2 & 9 & 17 & 5 \\
\hline
\end{tabular}
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline \(\mathbf{7 0 4 8}\) & & 7 & 0 & 4 & 8 \\
\hline & & 6 & 10 & 4 & 8 \\
\hline & & 6 & 9 & \(\mathbf{1 4}\) & 8 \\
\hline
\end{tabular}

Topic C: Renaming 137
e.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 30478 & 3 & 0 & 4 & 7 & 8 \\
\hline & 2 & 10 & 4 & 7 & 8 \\
\hline & 2 & 9 & 14 & 7 & 8 \\
\hline
\end{tabular}
f.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline \(\mathbf{8 0 9 4 6}\) & 8 & 0 & 9 & 4 & 6 \\
\hline & 7 & \(\mathbf{1 0}\) & 9 & 4 & 6 \\
\hline & 7 & \(\mathbf{9}\) & \(\mathbf{1 9}\) & 4 & 6 \\
\hline
\end{tabular}

\section*{Topic D：Subtraction with Borrowing}

When you subtract，the digit that you are taking away may be larger than the top digit in that same column．You must borrow from the column on the left．First，let＇s look at two examples using the place value shapes．

\section*{Example A：243－128＝}


\section*{2 hundreds}


4 tens
3 ones

Step 1： 3 ones－ 8 ones cannot be done
Borrow one ten and rename it as ten ones．Add the ten ones to the three ones．


2 hundreds


3 tens 13 ones

Now you can subtract： 13 ones -8 ones \(=5\) ones
Step 2：Subtract the tens． 3 tens -2 tens \(=1\) ten
Step 3：Subtract the hundreds． 2 hundreds－ 1 hundred＝ 1 hundred
Here is the question using numerals．


Example B: 350-124 =


Step 1: 0 ones - 4 ones cannot be done
Borrow one ten and rename it as ten ones.


10 ones -4 ones \(=6\) ones
Step 2: 4 tens -2 tens \(=2\) tens
Step 3: 3 hundreds -1 hundred \(=2\) hundreds
This is how the question looks using numerals.
\[
\begin{array}{r}
410 \\
350 \mid \\
-\quad 124 \\
\hline 226
\end{array}
\]

\section*{Exercise One}

You may need to borrow 1 ten and rename it as 10 ones to do these subtractions. Check your work using the answer key at the end of the exercise.
a. \(\begin{array}{r}53 \\ -\quad 16 \\ \hline 37\end{array}\)
b. \(\begin{array}{r}82 \\ -\quad 45 \\ \hline 37\end{array}\)
84
258
b. \(\begin{array}{r}82 \\ -\quad 45 \\ \hline 37\end{array}\)
h. \(\quad-\quad 6\)
ก. \(\quad-\quad 14\)
37
g. \(\quad-\quad 7\)
m. \(\quad-\quad 26\)
45
786
c. \(\quad-\quad 9\)
i. \(\quad-\quad 15\)
o. \(\quad-\quad 47\)
\(\begin{array}{r}28 \\ \text { d. } \quad-\quad 4 \\ \hline\end{array}\)
40
895
-
j. \(\quad-\quad 38\)
p. \(\quad-\quad 29\)
63
45
747
e. \(\quad-\quad 7\)
k. \(\quad-\quad 20\)
q. \(\quad-\quad 109\)
54
70
1. -21
r. \(\quad-420\)
438
\(\begin{array}{r}532 \\ \text { u. } \quad-\quad 314 \\ \hline\end{array}\)
956
s. \(\quad 215\)
w. -348
\(\begin{array}{r}953 \\ -\quad 838 \\ \hline\end{array}\)
795
t. -838
v. -238
x. -218

\section*{Answers to Exercise One}
a. 37
b. 37
d. 24
e. 56
f. 49
g. 18
h. 78
i. 30
j. 2
k. 25
n. 244
p. 866
q. 638
r. 222
C. 28
l. 49
m. 619
o. 739
s. 223
t. 115
u. 218
v. 557
w. 608
x. 356

To check your subtraction, add the answer (the difference) to the number you took away. If your subtracting was correct, the result of the adding will equal the number you started with in the subtraction question.

Example C: 726-317

726
Difference:
\[
\begin{array}{r}
-317 \\
\hline 409
\end{array}
\]

To check, add 409 to 317
409
\(\begin{array}{r}+317 \\ \hline 726\end{array}\)

You may need to borrow 1 ten and rename it as 10 ones to do these subtractions. Use the method for checking your answer beside each question. Check your work using the answer key at the end of the exercise.

42
37
a. \(\frac{-5}{37}\) check: \(\frac{+\quad 5}{42}\)

83
b. -6 check:

91
c. -7 check:

70
d. -4 check:

64
e. -37 check:

32
f. 16 check:

65
g. -16 check:

98
h. -39 check:

775
i. - 49 check:

974
j. \(\quad-\quad 26\) check:

483
k. \(\quad 75\) check:

896
1. - 57 check:

785
m. - 627 check:

961
n. -543 check:

941
o. - 319 check:

850
p. \(\quad 434\) check:

\section*{Answers to Exercise Two}
a. 37
b. 77
c. 84
d. 66
e. 27
f. 16
g. 49
h. 59
i. 726
j. 948
k. 408
l. 839
m. 158
n. 418
o. 622
p. 416

Use this same method of borrowing when you subtract the hundreds, thousands, ten thousands, and so on. Look at the place value shapes as you work through these examples.

Example D: 225-162


2 hundreds


2 tens


5 ones

Step 1: 5 ones -2 ones \(=3\) ones
Step 2: 2 tens - 6 tens (can't be done)
Borrow one hundred and rename it as 10 tens which you add onto the 2 tens.


12 tens -6 tens \(=6\) tens
Step 3: 1 hundred - 1 hundred = 0 hundreds

Note: The 0 in the hundreds is not needed in the answer (063) because it is the first digit and does not have to hold the place.

112
2215
\(-162\)
63

Example E: 331-145

Step 1: 1 one - 5 ones (can't be done)
Borrow 1 ten and rename it as 10 ones which you add onto the 1 one.


3 hundreds


3 tens

tens

11 ones -5 ones \(=6\) ones
Step 2: 2 tens -4 tens (can't be done)
Borrow one hundred and rename it as 10 tens which you add onto the 2 tens.


3 hundreds


2 tens


11 ones

Step 3: 2 hundreds - 1 hundred = 1 hundred


Subtract the following. Check your work using the answer key at the end of the exercise.
286
281
82
a. \(\begin{array}{r}-\quad 138 \\ \hline 148\end{array}\)
481
925
262
b. \(-\quad 225\)
g. \(\quad-\quad 68\)
1. -39
256
f. \(-\quad 175\)
k. \(\quad-\quad 79\)
390
260
h. -154
m. \(\quad 183\)
c. \(\quad 135\)
390
d. -135
379
452
i. \(\quad-\quad 235\)
n. -173
\(\begin{array}{r}734 \\ \text { e. } \quad-\quad 582 \\ \hline\end{array}\)
\(\begin{array}{r}532 \\ \text { j. } \quad-\quad 290 \\ \hline\end{array}\)
\(\begin{array}{r}692 \\ \text { o. } \quad-\quad 473 \\ \hline\end{array}\)
\(\begin{array}{r}634 \\ \text { p. } \quad-\quad 273 \\ \hline\end{array}\)
\(\begin{array}{r}465 \\ \text { q. } \quad-\quad 374 \\ \hline\end{array}\)

785
r. \(\quad-\quad 147\)
u. -208

937
s. -258
v. -154

46
t. -463
w. -254

621
x. \(\quad-\quad 442\)

\section*{Answers to Exercise Three}
a. 148
i. 144
q. 91
b. 256
j. 242
r. 638
c. 255
k. 3
s. 679
d. 152
l. 223
t. 483
e. 152
m. 244
u. 526
f. 106
n. 279
v. 409
g. 857
o. 219

พ. 528
h. 106
p. 361
x. 179

\section*{Exercise Four}

Subtract the following. Check your work using the answer key at the end of the exercise.
776
957
967
a. \(\quad-\quad 382\)
c. \(\quad-\quad 234\)
e. -173
\(\begin{array}{r}426 \\ \text { b. } \quad-\quad 327 \\ \hline\end{array}\)
845
406
d. \(\quad-\quad 416\)
f. -257


Now work through this example, where you must also rename one thousand as ten hundreds to do the subtraction.

Example F: 3 245-1 678

Step 1: Subtract the ones.
\[
\begin{array}{r}
315 \\
324|5| \\
-1678 \\
\hline 7
\end{array}
\]

Step 2: Subtract the tens.
\[
\begin{array}{r}
13 \\
1 \not 又 15 \\
324|5| \\
-1678 \\
\hline 67
\end{array}
\]

Step 3: Subtract the hundreds.


Step 4: Subtract the thousands and check.

\title{
1113 \\ 2 A 715 \\ 3245 \\ \(-1 \mathrm{~d} 78\) \\ 1567 \\ check
}

Find the differences. Check your work using the answer key at the end of the exercise.
4295
3527
4289
a. \(\quad-\quad 724\)
f. \(\quad-\quad 758\)
k. -2534

8281
3154
6753
b. \(\quad-\quad 470\)
g. \(\quad-\quad 205\)
1. -1942

5564
2640
8684
c. \(\quad-\quad 644\)
h. \(\quad-\quad 834\)
m. \(\quad-\quad 2916\)

6382
7355
7459
d. -882
i. \(\quad-\quad 4038\)
n. \(\quad-\quad 3927\)

8513
189
8360
e. \(\quad-\quad 829\)
j. -2348
о. \(\quad-\quad 6376\)

9418
p. \(\quad-\quad 4739\)

75762
9351
q. \(\quad-\quad 9351\)
t. \(\quad-\quad 9362\)
w. \(\quad-\quad 24762\)
\(\begin{array}{r}72641 \\ \text { r. } \quad-\quad 8736 \\ \hline\end{array}\)
s. \(\quad-\quad 7325\)
v. \(\quad-\quad 4538\)
u. \(\quad-\quad 9786\)

\section*{Answers to Exercise Five}
a. 3571
b. 7811
c. 4920
d. 5500
e. 7684
f. 2769
g. 2949
h. 1806
i. 3317
j. 2841
k. 1755
l. 4811
m. 5768
n. 3532
o. 1984
p. 4679
q. 66411
r. 63905
s. 9468
t. 3171
u. 62423
v. 29554
w. 17364
x. 37961

\section*{Exercise Six}

Find the differences. Check your work using the answer key at the end of the exercise.
a. \(\begin{array}{r}4262 \\ -\quad 2738 \\ \hline 1524\end{array}\)
4697
2831
c. \(\quad-\quad 3268\)
e. -289
3236
8321
5623
b. \(\quad-\quad 1594\)
d. \(-\quad 4543\)
f. -3352
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|}
\hline \multicolumn{2}{|l|}{\multirow[t]{2}{*}{}} & - & \[
\begin{aligned}
& 8428 \\
& 6309
\end{aligned}
\] & & - & 81328 22595 & s. & - & \begin{tabular}{l}
23244 \\
15534
\end{tabular} \\
\hline & & & 9629 & & & 58234 & & & 16121 \\
\hline \multicolumn{2}{|l|}{\multirow[t]{2}{*}{h.}} & & 7258 & n. & - & 23678 & t. & - & 12768 \\
\hline & & & 5230 & & & 28243 & & & 53507 \\
\hline \multicolumn{2}{|l|}{\multirow[t]{2}{*}{i.}} & - & 2456 & o. & - & 9578 & u. & - & 14421 \\
\hline & & & 3682 & & & 3245 & & & 31582 \\
\hline \multicolumn{2}{|l|}{\multirow[t]{2}{*}{j.}} & & 963 & p. & - & 1678 & v. & - & 14413 \\
\hline & & & 29285 & & & 6254 & & & 71629 \\
\hline \multicolumn{2}{|l|}{\multirow[t]{2}{*}{k.}} & & 18357 & q. & - & 1733 & W. & - & 12350 \\
\hline & & & 43325 & & & 5214 & & & 44610 \\
\hline & 1. & & 3187 & r. & - & 1783 & x. & - & 13071 \\
\hline \multicolumn{10}{|l|}{Answers to Exercise Six} \\
\hline & \multicolumn{3}{|l|}{a. 1524} & \multicolumn{3}{|l|}{i. 2774} & \multicolumn{3}{|l|}{q. 4521} \\
\hline & \multicolumn{3}{|l|}{b. 1642} & & 2719 & & & 3431 & \\
\hline & \multicolumn{3}{|l|}{c. 1429} & & 10928 & & & 7710 & \\
\hline & \multicolumn{3}{|l|}{d. 3778} & & 40138 & & t. & 3353 & \\
\hline & \multicolumn{3}{|l|}{e. 2542} & & 58733 & & u. & 39086 & \\
\hline & \multicolumn{3}{|l|}{f. 2271} & & 34556 & & v. & 17169 & \\
\hline & \multicolumn{3}{|l|}{g. 2119} & & 18665 & & w. & 59279 & \\
\hline & \multicolumn{3}{|l|}{h. 2371} & & 1567 & & x. & 31539 & \\
\hline
\end{tabular}

\section*{Zeroes in Subtracting}

You will have subtraction questions with a zero in the place that you want to borrow from. You have to do a double borrowing. Look carefully at the example.
\begin{tabular}{|c|c|}
\hline \multicolumn{2}{|l|}{Example G: \(2405-368=\)} \\
\hline \multicolumn{2}{|l|}{Step 1: 5 ones - 8 ones (can't be done)} \\
\hline \multicolumn{2}{|l|}{Borrow one ten - whoops - no tens!} \\
\hline \multicolumn{2}{|l|}{Borrow one hundred and rename it as 10 tens...} \\
\hline  & \[
\begin{array}{r}
310 \\
24|5| \\
-\quad 368 \\
\hline
\end{array}
\] \\
\hline \multicolumn{2}{|l|}{Now, borrow a ten. 15 ones -8 ones \(=7\) ones} \\
\hline & \[
\begin{gathered}
9 \\
3 \times 15 \\
2 \times 405 \mid \\
-368 \\
\hline
\end{gathered}
\] \\
\hline \multicolumn{2}{|l|}{\begin{tabular}{l}
Step 2: 9 tens -6 tens \(=3\) tens \\
Step 3: 3 hundreds -3 hundreds \(=0\) hundreds \\
Step 4: 2 thousands - no thousands \(=2\) thousands
\end{tabular}} \\
\hline & \[
\begin{aligned}
& \quad 9 \\
& { }^{3} \not \times \not 1815 \\
& 24|05| \\
& -368 \\
& \hline 2037
\end{aligned}
\] \\
\hline
\end{tabular}

Find the differences. Check your work using the answer key at the end of the exercise.
102
2075
50398
a. \(\quad-\quad 23\)
i. \(\quad-\quad 436\)
q. \(\quad-\quad 4247\)
508
3076
40683
b. \(\quad-\quad 39\)
j. \(\quad-\quad 594\)
r. \(\quad-\quad 3162\)
804
c. \(\quad-\quad 37\)
k. \(\quad-\quad 289\)
s. \(-\quad 5183\)
607
d. -48
6032
1. \(\quad-\quad 764\)
-
406
4057
m. \(\quad-\quad 2049\)
u. \(-\quad 21528\)
e. -178
60831
t. \(\quad 7081\)
30429
f. -218
n. \(\quad-\quad 2634\)
v. \(\quad-\quad 14953\)
203
9025
70543
g. \(-\quad 157\)
o. \(\quad-\quad 4603\)
5075
80106
601
h. -296
p. \(\quad-\quad 2364\)

\section*{Answers to Exercise Seven}
a. 79
b. 469
c. 767
d. 559
e. 228
f. 84
g. 46
h. 305
i. 1639
j. 2482
k. 3748
l. 5268
m. 2008
n. 3401
o. 4422
p. 2711
q. 46151
r. 37521
s. 45033
t. 53750
u. 18937
v. 15476
w. 32708
x. 32809

Find the differences. Check your work using the answer key at the end of the exercise.
\begin{tabular}{|c|c|c|c|c|c|c|c|c|}
\hline & & 400 & \multicolumn{3}{|r|}{200} & \multicolumn{3}{|r|}{2048} \\
\hline a. & - & 197 & f. & - & 99 & k. & - & 281 \\
\hline & & 307 & & & 400 & & & 6005 \\
\hline b. & - & 138 & g. & - & 43 & 1. & - & 2368 \\
\hline & & 800 & & & 208 & & & 5000 \\
\hline c. & - & 475 & h. & - & 126 & m. & - & 3468 \\
\hline & & 608 & & & 3000 & & & 4006 \\
\hline d. & - & 439 & i. & - & 2678 & n. & - & 2179 \\
\hline & & 307 & & & 7205 & & & 3007 \\
\hline e. & - & 168 & j. & - & 2306 & o. & - & 1930 \\
\hline
\end{tabular}
\(\begin{array}{r}2007 \\ \hline \quad 237\end{array}\)
p. \(\quad-\quad 237\)
\(\begin{array}{r}60125 \\ \text { s. } \quad 8421 \\ \hline\end{array}\)
80062
v. \(\quad-\quad 35087\)
\(\begin{array}{r}43004 \\ \text { q. } \quad-\quad 2873 \\ \hline\end{array}\)
40063
90035
t. \(\quad-\quad 2734\)
w. \(\quad-\quad 68746\)
20038
r. \(\quad-\quad 9156\)
70059
60063
u. \(\quad-\quad 38423\)
x. \(\quad-\quad 55895\)

\section*{Answers to Exercise Eight}
a. 203
b. 169
c. 325
d. 169
e. 139
f. 101
g. 357
h. 82
i. 322
j. 4899
k. 1767
l. 3637
m. 1532
n. 1827
o. 1077
p. 1770
q. 40131
r. 10882
s. 51704
t. 37329
u. 31636
v. 44975
w. 21289
x. 4168

If a subtraction question has the numbers side by side, rewrite the question in columns. Put the ones under the ones, the tens under the tens, the hundreds under the hundreds, etc.

\section*{Exercise Nine}

Rewrite each question in columns and find the difference. Check your work using the answer key at the end of the exercise.
5042
34582

\section*{a. -3185}
e. \(\quad 6121\)
8042
44610
b. -6368
f. -4527
2630
54507
c. \(\quad 95\)
g. \(\quad 13421\)
1201
d. \(\quad 159\)
7050
h. -2144

71629
i. \(\quad 12350\)

64182
j. \(\quad-\quad 28934\)

\section*{Answers to Exercise Nine}
a. 1857
b. 1674
c. 2535
d. 1042
e. 28461
f. 40083
g. 41086
h. 4906
i. 59279
j. 35248

\section*{Topic D: Self-Test}

\section*{Mark /15 Aim 11/15}
A. Find the differences. Be sure to check your answers using addition. (12 marks)
71
704
400
a. \(\quad-\quad 32\)
b. -325
c. \(\quad 208\)
\begin{tabular}{|c|c|c|c|c|c|c|c|c|}
\hline \multirow[b]{2}{*}{d.} & & 8923 & \multirow[b]{2}{*}{g.} & & 9074 & \multirow[b]{2}{*}{j.} & \multicolumn{2}{|r|}{\multirow[t]{2}{*}{\[
\begin{array}{r}
86502 \\
6590
\end{array}
\]}} \\
\hline & - & 3061 & & - & 5482 & & & \\
\hline & & 5211 & & & 8092 & & & 47293 \\
\hline e. & - & 4390 & h. & - & 6578 & k. & - & 26349 \\
\hline & & 8204 & & & 49053 & & & 73050 \\
\hline f. & - & 3461 & i. & - & 8954 & 1. & - & 27455 \\
\hline
\end{tabular}
B. Subtract. (3 marks)
a. \(5302-3981=\)
b. \(7043-95=\)
c. \(6000-989=\)

\section*{Answers to Topic D Self-Test}
A.
a. 39
a. 1321
b. 379
b. 6948
c. 192
c. 5011
d. 5862
e. 821
f. 4743
g. 3562
h. 1514
i. 40099
j. 79912
k. 20944
l. 45595
B.

\section*{Topic E: Estimating Answers in Subtraction}

You have learned how to round numbers. Now you can use that skill in rounding numbers to find an approximate difference.

By estimating your answer first, you can tell if your answer is sensible.
In these examples, estimate the answer. Round each number BEFORE you subtract.
\begin{tabular}{|c|c|c|c|c|c|}
\hline \multirow{3}{*}{Example A:} & \multirow{3}{*}{-} & \multirow[t]{2}{*}{\[
\begin{aligned}
& 47 \\
& 26
\end{aligned}
\]} & \multirow[t]{2}{*}{rounds to rounds to} & \multirow[b]{2}{*}{-} & \multirow[t]{2}{*}{\[
\begin{aligned}
& 50 \\
& 30
\end{aligned}
\]} \\
\hline & & & & & \\
\hline & & & & & 20 \\
\hline \multirow{3}{*}{Example B:} & & 870 & rounds to & & 900 \\
\hline & - & 342 & rounds to & - & 300 \\
\hline & & & & & 600 \\
\hline
\end{tabular}
Example C: \begin{tabular}{rrr}
24397 & rounds to & 24000 \\
& \(-\quad 6148\) & rounds to \(\quad-\quad 6000\) \\
\hline & & 18000
\end{tabular}

Usually you estimate to the largest place value that you can.

\section*{Exercise One}

Estimate the differences. Round the numbers before you subtract. Check your work using the answer key at the end of the exercise.

b. \(\begin{array}{r}70534 \approx \\ -\quad 7689 \approx \\ \hline\end{array}\)
687
c. -438
8442
е. -1876
5630
f. -1752
g. \(\begin{array}{r}5342 \\ -\quad 3647 \\ \hline\end{array}\)
7111
h. \(\quad-\quad 5982\)
i. \(\begin{array}{r}6031 \\ -\quad 2899 \\ \hline\end{array}\)
41573
j. \(\quad-\quad 4846\)
36154
k. \(\quad-\quad 9038\)

46124
1. \(-\quad 9762\)

54751
m. \(\quad-\quad 7896\)

72450
n. \(\quad-\quad 31924\)

81692
o. \(\quad-\quad 53908\)

92163
p. \(\quad-\quad 45517\)

171234
q. \(\quad-\quad 82169\)

\section*{102085}
r. \(\quad-\quad 36526\)

\section*{Answers to Exercise One}
a. \(10000-7000=3000\)
b. \(71000-8000=63000\)
c. \(700-400=300\)
d. \(800-200=600\)
e. \(8000-2000=6000\)
f. \(6000-2000=4000\)
g. \(5000-4000=1000\)
h. \(7000-6000=1000\)
i. \(6000-3000=3000\)
j. \(42000-5000=37000\)
k. \(36000-9000=27000\)
l. \(46000-10000=36000\)
m. \(55000-8000=47000\)
o. \(80000-50000=30000\)
p. \(90000-50000=40000\)
q. \(170000-80000=90000\)
r. \(100000-40000=60000\)

\section*{Estimating Answers in Subtraction Word Problems}

When you are solving word problems, an estimate tells you if your answer makes sense. You can use your estimate to help you check your answers. If your answer and the estimate are not close, then you know that you should subtract your numbers again.

\section*{Exercise Two}

Estimate the following answers. Be sure to round to the largest place value possible before adding or subtracting. Remember to circle the information and underline what is being asked. Check your work using the answer key at the end of the exercise.

\section*{Example:}

On a recent petition about sales tax, Mulan had 2865 people sign. Arnav had 1564 people sign the petition. Estimate how many more people Mulan had sign than Arnav.
On a recent petition about sales tax, Mulan had 2865 people sign. Arnav had 1564 people sign the petition. Estimate how many more people Mulan had sign than Arnav.
\[
\begin{aligned}
& 2865 \text { Estimate: } 3000 \\
& -1564-2000 \\
& 1000
\end{aligned}
\]

Mulan had 1000 more people sign the petition.
a. On Tuesday, a coffee shop had sales of \(\$ 8523\). On Wednesday, the same coffee shop had sales of \$6 914. Estimate the difference between Tuesday's sales and Wednesday's sales.
b. Last week, 4931 passengers used the ABE Taxi Company. This week, there were 3491 passengers. Estimate how many more passengers used ABE Taxi Company last week.
c. In Japan, people chew 52700 tons of gum. In Russia, people chew 25700 tons of gum. Estimate the how many more tons of gum the Japanese chew.
d. In Colombia there are 1897 bird species. In China, there are 1319 bird species. Estimate how many more bird species there are in Colombia.
e. The whale shark weighs 30500 kilograms. The basking shark weighs 9258 kilograms. Estimate how much more the whale shark weighs.
f. In India there were 155204 post offices in 2007. In China there were 59886 post offices. Estimate the difference.
g. By 2008, the Montreal Canadiens had played the most games 5792 . The Buffalo Sabres had played 2 952. Estimate how many more games the Montreal Canadiens had played.
h. In 2006, the population of Kelowna was 162 276. The population of Prince George was 83225. Estimate how many more people live in Kelowna in 2006.

\section*{Answers to Exercise Two}
a. \(\$ 9000-\$ 7000=\$ 2000\)
b. \(5000-3000=2000\) passengers
c. \(50000-30000=20000\) tons
d. \(2000-1000=1000\) species
e. \(31000-9000=22000\) kilograms
f. \(160000-60000=100000\) post offices
g. \(6000-3000=3000\) games
h. \(160000-80000=80000\) people

\section*{Topic E: Self-Test}

\section*{Mark /18 Aim 14/18}
A. Estimate the differences. Show your work. (12 marks)

73

4071
e. -2986

5946
f. \(\quad-\quad 4281\)
\(\begin{array}{r}57201 \\ \text { g. } \quad-\quad 5892 \\ \hline\end{array}\)
\(\begin{array}{r}57201 \\ \text { g. } \quad-\quad 5892 \\ \hline\end{array}\)
23006
h. \(\quad-\quad 4999\)


49053
i. \(\quad-\quad 28954\)
d. -214
c. \(\quad 385\)

467

36174
j. \(\quad-\quad 16925\)

86502
k. \(\quad-\quad 26590\)

943982
- 28954
\(-16925\)
943982
1. \(\quad-\quad 721354\)
B. Estimate each of the following word problems. (6 marks) Be sure to include the unit of
measure in your answer. (2 marks each) Be sure to circle information and underline what is being asked.
a. A magazine has 54823 readers. Last year the magazine had 26876 readers. By how much did number of readers increase?
b. In 2009, the number of marriages per year in Japan was 964702 . The number of marriages per year in Egypt was 525 412. How many more marriages were there in Japan than Egypt?
c. In 2010, in France there were 235846 people with the last name Martin. There were 78177 people with the last name Moreau. How many more Martins were there?

\section*{Answers to Topic E Self-Test}
A.
a. 40
b. 50
c. 500
d. 300
e. 1000
f. 2000
g. 51000
h. 18000
i. 20000
j. 20000
k. 60000
l. 200000
B.
a. 20000 readers
b. 500000 marriages
c. 160000 Martins

\section*{Topic F: Problem Solving}

Why are you studying mathematics?
Some of you are taking math because you have to, but we hope you all want to have math skills to help you in your jobs, in job training, and in your everyday life. Numbers are an important part of our lives - we are surrounded by numbers.

Numbers are not often by themselves or set up neatly on a page for us to add or subtract. Numbers are usually in the middle of sentences and mixed in with other numbers. Sorting out the numbers you want and deciding what to do with those numbers is called problem-solving.

You are going to learn five problem-solving steps that will be useful in all your math work in courses, in jobs, and in your everyday life.

\section*{Problem Solving Steps}

Step 1: Read or listen to the problem carefully. Understand the problem. Are there words that help you imagine what is happening? Can you draw a picture or diagram to show what is happening? Can you say the problem in your own words? What is the question? Underline it.

Step 2: What does the problem tell you? What do you know? Write down or circle the information you have. Often you have more information than you need. Think about the question you need to answer, and use only the information that will help you answer that question. What do you want to find out?

Step 3: What must you do with the information to answer the question? What arithmetic operation should you use addition, subtraction, multiplication or division? You will be learning keywords and patterns that will help you choose the correct operation. Write an equation for the problem, An equation is a number sentence such as
\(12+5=\) \(\qquad\)
Step 4: Estimate the answer.
- Round the numbers so you can work with them quickly.
- Use the operation you chose in Step 3 and come to a quick answer.
- Does this estimated answer make sense? Does it answer the question in the problem? THINK about this before you do Step 5.

Step 5: Solve the problem using the actual numbers.
- Check your arithmetic calculations.
- Compare your result to your estimated answer.
- Reread the problem. Does your answer make sense?
- Write a sentence answer to the problem.

You must always say what the numbers are counting. He has 4, means nothing. We need to know 4 what... 4 children? 4 dogs? 4 dollars? These are called the units.
```

Some abbreviations used with numerals:

```
```

kilometre km
metre m
centimetre cm
kilogram kg
gram g
litre L
hour h
minute min

```

Now study the three example problems that show the five steps.

\section*{Example A}

Jorge earned \(\$ 165\) last week and \(\$ 142\) this week in his job pumping gas at the service station. He spent \(\$ 15\)
on his girlfriend's gift. How much did he earn pumping gas?
Step 1: Read. Understand the problem. Find the question. Underline it.
How much did Jorge earn pumping gas?
Step 2: Find the Needed information. circle it.
Jorge earned \$165 and \$142.
The information about his girlfriend's gift has nothing to do with finding out how much he earned.
Step 3: What Arithmetic operation to use?
We are putting together two amounts. That is addition.
The equation: \(\quad \$ 165+\$ 142=\) what he earned.
Step 4: Estimate
\$165 + \$142
\(\$ 170+\$ 140=\$ 310\)
\(\$ 200+\$ 100=\$ 300\)

Is about \(\$ 300\) a reasonable answer to the question? Is it sensible to earn \(\$ 300\) for two weeks of pumping gas? Probably. \(\$ 3000\) would not be sensible, and \(\$ 30\) would not be sensible.

Step 5: Solve, check, write a sentence answer.
\$165 + \$142 = \$307
check by adding again
is \(\$ 307\) close to the estimate?
make sense?
Jorge earned \$307 pumping gas.

\section*{Example B}

The town of Gloryville had a population of 4206 people before the mill had a big lay-off in May 2007. Since then 858 people have moved away. Find the population of Gloryville now.
Step 1: Read, understand the problem, find the question underline it.
Find the population of Gloryville now.
Step 2: Circle needed information.
4206 people before
858 people moved away
The date of the lay-off is not needed to answer the question.
Step 3: Operation
One amount is being taken away. That is subtraction.
Equation: 4206 - 858 = people in Gloryville now.
Step 4: estimate
4-206-858
\(4000-1000=3000\)
\(4200-900=3300\)
Step 5: solve, check, write sentence answer


Gloryville has a population now of 3348 people.

\section*{Example C}

Paul works at a lumber mill and is paid every two weeks. He has an account at the bank. Today he got a cheque for \(\$ 845\). He and his wife decided to deposit \(\$ 600\) in the account and keep the rest of the money out for a weekend trip. How much money did Paul and his wife keep out for the weekend trip?

Step 1: Question
how many did Paul and his wife keep for the weekend trip?

\section*{Can I draw a picture or diagram?}


\section*{Step 2: needed information}

Paul got a cheque for \(\$ 845\) for two weeks work.
He and his wife decided to put \(\$ 600\) in their account.
Step 3: Operation
One amount is being taken away. That is subtraction. Equation: \$845-\$600 = money left over for weekend trip
Step 4: Estimate
\$845-\$600 = \$245
Step 5: check.
```

\$250 + \$600 = \$845
close to estimate?
makes sense?
Paul and his wife have \$245 for the weekend trip.

```

\section*{Addition Problems}

The problems in this section all use the addition operation to find the solution (the answer to the problem). Addition problems give two or more amounts that must be put together (added). When you read the problems, pay special attention to key words and patterns that will help you to recognize other addition problems.

\section*{Key words that point to Addition}
- sum
- entire
- complete
- combine
- in all
- total
- altogether

\section*{Exercise One}

Do these problems by following the five problem solving steps. It is good practice to write down each step while you are learning this method. Check your work using the answer key at the end of the exercise.
a. It was raining so Gita decided to bake several batches of cookies and freeze them. She made 75 chocolate chip cookies, 96 of her son’s favourite ginger snaps, and 42 fancy -Birds’ nestll cookies for when she had company. How many cookies did Gita bake altogether?
- Step 1: What is the question? Underline it.
- Step 2: What information are you given that you need to solve the problem? Circle) it.
- Step 3: What arithmetic operation should you use? addition Why?
- Step 4: Estimate the answer using rounded numbers.
- Step 5: Solve, check, and write a sentence answer.
b. Levi wanted to paint his apartment and needed to buy some supplies. Brushes cost \(\$ 10\), sandpaper
cost \(\$ 4\), a paint roller and tray cost \(\$ 9\) and the paint was \(\$ 55\). How much did it cost for all the paint supplies?
- Step 1: What is the question? Underline it.
- Step 2: What information are you given that you need to solve the problem? Circle it.
- Step 3: What arithmetic operation should you use? addition Why?
- Step 4: Estimate the answer using rounded numbers.
- Step 5: Solve, check, and write a sentence answer.
c. Altogether, the college has 475 students in the Adult Basic Education department, 320 University Transfer students, 64 students in the Early Childhood Education program, 232 students in the Forestry department, and 125 students in trades courses. How many students are at the college?
- Step 1: What is the question? Underline it.
- Step 2: What information are you given that you need to solve the problem? Circle it.
- Step 3: What arithmetic operation should you use? addition Why?
- Step 4: Estimate the answer using rounded numbers.
- Step 5: Solve, check, and write a sentence answer.
d. Zhou works part-time at the daycare centre. Last month she worked every week. The first week she worked 24 hours, 36 hours the second week, 29 hours the third week, and only 17 hours in the fourth week. Give the total number of hours that Zhou worked last month.
- Step 1: What is the question? Underline it.
- Step 2: What information are you given that you need to solve the problem? Circle it.
- Step 3: What arithmetic operation should you use? addition Why?
- Step 4: Estimate the answer using rounded numbers.
- Step 5: Solve, check, and write a sentence answer.
- The rest of the problems in this exercise just ask you for the estimate and the actual solution. You must still follow all five steps but you do not have to write everything down. Remember that the solution to problems must include the units (what is being counted) and should be written in a sentence answer.
e. September is hard on the family budget! Amul figured they spent \(\$ 275\) for clothes and shoes for their two little daughters, \(\$ 43\) for school supplies, \(\$ 24\) for haircuts, and \(\$ 130\) to enroll them in the Figure Skating Club. How much has Amul spent getting his children ready for school and skating?
- Estimation:
- Actual Solution:
f. The sign in the elevator says - 1200 kg maximum weightll. Can the elevator hold all these large
football players safely? Sean weighs 91 kg , Raja is 114 kg , Eyota is a heavyweight at 159 kg . Kiefer is even heavier at 168 kg , the two fullbacks weigh 135 kg and 148 kg , and the quarterback Juan is a muscular 87 kg . Find their combined weight to see if they are all safe in the elevator.
- Estimation:
- Actual Solution:
g. On their holidays, the Matthews family drove to Saskatchewan from their home in Langley. They drove 620 km the first day, 810 km the second day, and only drove 350 km the next day because they went to Head Smashed-in Buffalo Jump Museum. On the fourth day, they drove a long 1208 km. How many kilometres did they drive on their trip to Saskatchewan?
- Estimation:
- Actual Solution:

\section*{Answers to Exercise One}
(The wording in the sentences will vary, but this is the idea)
a. How many cookies altogether?
- she made 75, 96, and 42 cookies
- All the amounts have to be put together to find a total.
- \(80+100+40=220\) cookies
- 75+96+42=213 cookies
- Gita baked 213 cookies altogether
b. How much did it cost for all the paint supplies?
- He paid \$ 10, \$4, \$9, and \$55
- All the amounts have to be put together to find a total
- Rounding one digit numbers isn't too helpful, but \$10+\$0+\$10+\$60=\$80
- \$10+\$4+\$9+\$55=\$78 Levi paid \$78
c. how many students at the college?
- There are 475, 320, 232, and 125 students.
- You must find a total.
- \(500+300+100+200+100=1200\) students
- \(475+320+64+232+125=1216\) students
- The college has 1216 students
d. How many hours did Zhou work last month?
- She worked 24, 36, 29, and 17 hours.
- You are looking for an amount altogether.
- \(20+40+30+20=110\) hours
- \(24+36+29+17=106\) hours
- Zhou worked 106 hours last month
e. \(\$ 472\) altogether
f. 902 kg altogether; safe
g. 2988 km

\section*{Subtraction Problems}

These problems will give you a change to get the feel of subtraction problems.
Subtraction problems tell you an amount and then take something away from that amount. Money might be spent, saved, or deducted (taken off), people might move away, items might be sold or lost. These types of subtraction problems are quite easy to recognize.

A more difficult type of subtraction problem compares two amounts. You will be asked to find the difference between the amounts. Subtract to find the difference. These problems might ask you, how much more?, how much less?, how many fewer?, how much farther?, how much did it increase (go up)?, what is the decrease (amount it went down)? You might also have to find the age of something by comparing the dates.

\section*{Key Words that point to SUBTRACTION}
- difference
- balance
- amount left
- the saving
- how much more (or greater, or farther)
- how much less (or fewer, or smaller)
- how old, find the age

\section*{Exercise Two}

Use the five problem steps to solve these problems. Write down each step for the first three problems. Check your work using the answer key at the end of the exercise.
a. Only 368 people went to the movie theatre on Friday night, but on Saturday 756 went to see the new comedy movie they were showing. How many more people went to the theatre on Saturday than on Friday?
- Step 1: What is the question? Underline it.
- Step 2: What information are you given that you need to solve the problem? Circle it.
- Step 3: What arithmetic operation should you use? subtraction Why?
- Step 4: Estimate the answer using rounded numbers.
- Step 5: Solve, check, and write a sentence answer.
b. The highway construction started in 2004 and it was finished in 2010. How long did the construction take?
- Step 1: What is the question? Underline it.
- Step 2: What information are you given that you need to solve the problem? Circle it.
- Step 3: What arithmetic operation should you use? subtraction Why?
- Step 4: Estimate the answer using rounded numbers. In a question like this, an estimation using rounded numbers is not useful because the numbers are too similar and would round to the same number. Instead, think about the question carefully and figure out an approximate answer in your head.
- Step 5: Solve, check, and write a sentence answer.
c. Aimee's gross pay was \(\$ 1656\), but she had \(\$ 331\) of deductions. What is her net pay? (Gross pay is the amount we earn before anything is taken off. Net pay is the amount we take home after taxes, pension, employment insurance, etc. have been deducted.)
- Step 1: What is the question? Underline it.
- Step 2: What information are you given that you need to solve the problem? Circle) it.
- Step 3: What arithmetic operation should you use? subtraction Why?
- Step 4: Estimate the answer using rounded numbers.
- Step 5: Solve, check, and write a sentence answer.
d. Mike and Ann want to can 240 jars of fruit this year. They have already canned 165 jars. How many more jars do they need to do?
- Estimation:
- Actual Solution:
e. Jian has purchased a used car for \(\$ 3599\). He has paid \(\$ 450\) so far. How much more money does he owe?
- Estimation:
- Actual Solution:
f. In 1956 the population of the town was 10874 . Many people left after the dam construction was finished. The population in 1989 was only 7892 people. How much less was the population in 1989 than in 1956?
- Estimation:
- Actual Solution:

\section*{Answers to Exercise Two}
a. How many more people at the theatre on Saturday than on Friday?
- 368 people on Friday; 756 on Saturday
- You must find the difference between two amounts.
- \(800-400=400\) more people on Saturday
- \(756-368=388\) more people on Saturday
b. How long did the construction take?
- Started in 2004; ended in 2010.
- Find the difference between the two dates.
- Think -from 2004 to 2010 - about 5 yearsll
- 2010-2004 = 6 years for the road construction
c. What is Aimee's net pay?
- Her gross pay was \(\$ 1656\) and she had \(\$ 331\) taken off (deducted).
- Subtract to find how much is left.
- \$1700-\$300 = \$1 400
- \$1 \(656-\$ 331=\$ 1325\) net pay
d. 75 jars
e. \(\$ 3149\) still owed
f. 2982 people less

\section*{Mixed Addition and Subtraction Problems}

Exercise Three

Use the 5 problem solving steps. Look for key words and patterns to help you choose the correct operation. Estimate the answer using rounded numbers if the numbers have 2 digits or more. Check your work using the answer key at the end of the exercise.
a. Enrico worked 37 hours one week and 26 hours the next week. How many hours did he work?
- Estimation:
- Actual Solution:
b. Myung-Hee had \(\$ 85\). She spent \(\$ 37\) for groceries. How much did she have left?
- Estimation:
- Actual Solution:
c. Ann bought 25 kg of potatoes. She used 13 kg the first week. How much did she have left?
- Estimation:
- Actual Solution:
d. The sign in a furniture store read, \(\$ 35\) off all chairs. How much will a chair cost that was \(\$ 125\) before the sale?
- Estimation:
- Actual Solution:
e. Guillaume bought a pair of jeans for \(\$ 29\) at a sale. When he got home, he found the price tag on the jeans had been \(\$ 48\). How much did Guillaume save?
- Estimation:
- Actual Solution:
f. British Columbia has an area of 947800 square kilometres. The area of Alberta is 666190 square kilometres. BC is how much larger than Alberta?
- Estimation:
- Actual Solution:
g. Maxine paid \(\$ 26\) for an electric iron and \(\$ 39\) for an ironing board. How much did she pay for both?
- Estimation:
- Actual Solution:
h. Ang bought a used TV set for \(\$ 125\). She made a down payment of \(\$ 40\). How much does she still owe on the set?
- Estimation:
- Actual Solution:
i. Paulo had \(\$ 325\) in the bank. He wrote a cheque for \(\$ 76\). How much money did he have left in the bank?
- Estimation:
- Actual Solution:
j. Mizu weighs 99 kg . Akula weighs 81 kg . How much heavier is Mizu than Akula?
- Estimation:
- Actual Solution:
k. Kenji has three children. One weighs 25 kg , another weighs 20 kg , and the last weighs 17 kg . How much do they weigh together?
- Estimation:
- Actual Solution:
1. Rafael bought a boat priced at \(\$ 8400\). He was given \(\$ 1250\) as a trade-in on his old boat. How much does he owe on the new boat?
- Estimation:
- Actual Solution:
m . Last week Luis earned \(\$ 212\). The week before he earned \(\$ 198\). This week he earned \(\$ 133\). How much did he earn in all?
- Estimation:
- Actual Solution:
n. Jakob went on a trip of 739 km . The first day he drove 561 km . How many kilometres did he have left to drive?
- Estimation:
- Actual Solution:
o. In 2005 Jacques’ net income was \(\$ 29\) 675. In 2006 his net income was \(\$ 30207\). How much more did he earn in 2006?
- Estimation:
- Actual Solution:

\section*{Answers to Exercise Three}
a. 63 hours
b. \(\$ 48\) left
c. 12 kg of potatoes left
j. 18 kg heavier
d. \(\$ 90\) for the chair
k. 62 kg altogether
e. \(\$ 19\) saved
l. \(\$ 7150\) still owed
f. 281610 square kilometres
m. \(\$ 543\) in all
g. \(\$ 65\) in all
n. 178 km left to drive
h. \(\$ 85\) still owed
o. \$532 more
i. \(\$ 249\) left in the bank

\section*{Two-Operation Questions}

Sometimes you may need to use two operations to solve a question. We work from left to right when solving questions that involve two operations. If addition is first, you must do the addition first then the subtraction. If subtraction is first, you must do the subtraction first and then do the addition.
```

Example D: 342 + 325 - 146 =

```

Step 1: \(342+325=667\)
Step 2: Use your answer and subtract 146
667
- 146

521
\(342+325-146=521\)
```

Example E: 475 - 284 + 362 =

```

475
Step 1: -284
191
Step 2: use your answer and add 362
```

    191
    + 362
        553
    475-284+362=553

```

\section*{Exercise Four}

Find the sum or difference for each question. Check your work using the answer key at the end of the exercise.
a. \(312+541-135=\)
b. \(427+231-384=\)
c. \(687-434+256=\)
d. \(754-576+393=\)
e. \(1456+218-295=\)
f. \(2461+723-349=\)
g. \(3857-665+1234=\)
h. \(4367-843+5679=\)

\section*{Answers to Exercise Four}
a. 718
b. 274
c. 509
d. 571
e. 1379
f. 2835
g. 4426
h. 9203
i. 2790
j. 4556
k. 5664
l. 3459
m. 11770
n. 5406
o. 38896
p. 64669

\section*{Two-Operation Problems}

Sometimes you may need to use more than one operation to solve a word problem or a real- life problem.

Janet bought a submarine sandwich for \(\$ 5\), a soft drink for \(\$ 1\), and some carrot cake for \(\$ 3\). She gave the cashier a twenty dollar bill. How much money did she get back as change?

Step 1: Question: How much change from \(\$ 20\) ?
Step 2: Information: Spent \(\$ 5\) and \(\$ 1\) and \(\$ 3\). Gave cashier \(\$ 20\).
Step 3: Operations
1. Add the amounts she spent to find the total: \(\$ 5+\$ 1+\$ 3=\)
2. Subtract the amount she spent from \(\$ 20\) : \(\$ 20\) - total of what she spent \(=\) change

Step 4: Estimate
Numbers are only one digit so do not round them. But a quick add tells you that her change will be about \(\$ 10\).
Step 5: Solve
1. \(\$ 5+\$ 1+\$ 3=\$ 9\) total spent
2. \(\$ 20-\$ 9=\$ 11\)

Janet will get \(\$ 11\) in change.

Exercise Five

Use the 5 problem solving steps. Look for key words and patterns to help you choose the correct operation. Estimate the answer using rounded numbers if the numbers have 2 digits or more. Show all your work. Check your work using the answer key at the end of the exercise.
a. Maureen weighed 72 kg and decided to go on a diet for her New Year's Resolution. She lost 3 kg in January, 2 kg in February, and 4 kg in March. How much did she weigh after her three month diet?
- Estimation:
- Actual Solution:
b. The local Girl Guides and Brownies had a goal to sell 2850 boxes of Girl Guide cookies. In the first week the Brownies sold 975 boxes and the Guides sold 1138 boxes. How many more boxes do they need to sell to reach their goal?
- Estimation:
- Actual Solution:
c. Pat is ready to start first year college; she received a Passport to Education award from the provincial government which was \(\$ 625\). She got a Rotary Club Scholarship of \(\$ 250\) and a science scholarship of \(\$ 400\). Her first year's tuition and books are going to cost \(\$ 2000\). Pat will use all her awards and scholarships. How much more money will she need to pay?
- Estimation:
- Actual Solution:
d. The elementary school had 83 girls and 95 boys enrolled in September. Five of the girls and three of the boys moved away in September. How many children were still enrolled in the school at the end of September?
- Estimation:
- Actual Solution:
e. Franco is on a 1200 calorie-a-day diet. He had 320 calories at breakfast and 468 calories at lunch. How many calories does he have left for dinner?
f. Lilo had a total of 150 hats in four boxes. In box one there were 72 hats. In box two, there were 28 hats. In box three, there were 47 hats. How many hats were in box four?
g. Miguel wanted to buy a Blue ray player for \(\$ 225\). He got \(\$ 65\) for his birthday. He won \(\$ 75\). How much more money does Miguel need?
h. Kehara and Omar decided to visit their grandmother who lives 160 kilometres away. They travelled 50 kilometres and stopped for gas. They travelled another 30 kilometres and stopped for lunch. How much farther is it to their grandmother's house?
i. Kuen had \(\$ 7342\) in his bank account. He decided to buy a new television for \(\$ 1139\). Kuen was able to save another \(\$ 697\). How much does Kuen have in his bank account?
j. Giles wishes to buy three gifts that cost \(\$ 15, \$ 9\) and \(\$ 12\). He has \(\$ 11\) of the money he needs. How much more money does he need to earn in order to buy the gifts?
k. Colette bought items costing \(\$ 34, \$ 19\), \(\$ 65\) and \(\$ 129\). She used a coupon worth \(\$ 75\). How much money does she still owe?
1. Sahale had 25 metres of fencing. He wanted to fence his garden that was 53 metres long and 38 metres wide. How much more fencing does Sahale need to buy? (Hint: To put a fence around means the perimetre. Draw a picture before you begin.)

\section*{Answers to Exercise Five}
a. 63 kg
g. \(\$ 85\) more
b. 737 boxes of cookies more
h. 80 kilometres
c. \(\$ 725\) more
d. 170 children still enrolled
i. \(\$ 6900\)
e. 412 calories
j. \$25 more
f. 3 hats
k. \$172
l. 157 metres

\section*{Topic F: Self-Test}

\section*{Mark /14 Aim 12/14}

Solve these problems. Show all your work. Give yourself one mark for the correct method and one mark for the correct answer. (14 marks)
A. Alice weighed 86 kg . She went on a diet. Now she weighs 69 kg . How much did she lose?
- Estimation:
- Actual Solution:
B. Jacques spent \(\$ 49\) on a pair of jeans, \(\$ 18\) for a shirt, \(\$ 12\) for a belt, and \(\$ 3\) for socks. How much did he spend altogether?
- Estimation:
- Actual Solution:
C. Bookshelf had 94 books on the top shelf, 86 on the middle shelf, and 79 on the bottom shelf. How many books are there on the three shelves?
- Estimation:
- Actual Solution:
D. Mahad bought a new car for \(\$ 9\) 989. He traded in his old car for \(\$ 1785\). How much more was the new one than the value of his trade-in?
- Estimation:
- Actual Solution:
E. Kian and Toran picked apples for their uncle. Kian picked 509 kg and Toran picked 436 kg . (4 marks)
a. How many more kilograms of apples did Kian pick than Toran?
- Estimation:
- Actual Solution:
b. How many kilograms of apples did they pick together?
- Estimation:
- Actual Solution:
F. During an election, Dominique counted 4721 votes and 8956 votes. The number of spoiled ballots was 1639 . How many were good votes? (This question is worth 4 marks).

\section*{Answers to Topic F Self-Test}
A. \(86 \mathrm{~kg}-69 \mathrm{~kg}=17 \mathrm{~kg}\)
B. \(\$ 49+\$ 18+\$ 12+\$ 3=\$ 82\)
C. \(94+86+79=259\) books
D. \(\$ 9989-\$ 1785=\$ 8204\)
E.
a. \(509 \mathrm{~kg}-436 \mathrm{~kg}=73 \mathrm{~kg}\) more
b. \(509 \mathrm{~kg}+436 \mathrm{~kg}=945 \mathrm{~kg}\) altogether
F. 12038 votes

\section*{Unit 3 Review: Subtraction}

You will now practice all of the skills you learned in Unit 3. Check your work using the answer key at the end of the review.
A. Find the differences.
58
98
45
a. \(\quad-\quad 24\)
c. \(\quad-\quad 75\)
e. -21
99
87
d. \(\quad-\quad 34\)
f. -35
B. Find the differences.
995
579
468
a. -423
c. \(\quad-\quad 458\)
e. \(\quad-\quad 432\)
\(\begin{array}{r}987 \\ \text { b. } \quad-\quad 316 \\ \hline\end{array}\)
877
686
d. \(\quad-\quad 602\)
f. \(\quad-\quad 271\)
C. Find the differences.
1265
6889
62589
a. \(\quad-\quad 541\)
c. \(\quad-\quad 2506\)
e. -1375
b. \(\begin{array}{r}4587 \\ -\quad 534 \\ \hline\end{array}\)
d. \(\quad-\quad 5104\)
54567
f. \(\quad-\quad 3253\)
44293
86477
37516
g. \(\quad-\quad 13701\)
h. \(\quad-\quad 16216\)
i. \(\quad-\quad 21413\)
D. Rewrite each question in columns and find the differences.
a. \(968-343=\)
b. \(865-432=\)
c. \(7482-5061=\)
d. \(11589-5326=\)
e. \(97383-42362=\)
f. \(109861-58240=\)
E. Borrow from the number in the shaded box.
a.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 392 & & & & & \\
\hline & & & & & \\
\hline
\end{tabular}
b.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 821 & & & & & \\
\hline & & & & & \\
\hline
\end{tabular}
c.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 6739 & & & & & \\
\hline & & & & & \\
\hline
\end{tabular}
d.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 4528 & & & & & \\
\hline & & & & & \\
\hline
\end{tabular}
e.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 24986 & & & & & \\
\hline & & & & & \\
\hline
\end{tabular}
f.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 47182 & & & & & \\
\hline & & & & & \\
\hline
\end{tabular}
F. Borrow from the number in the shaded box.
a.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 302 & & & & & \\
\hline & & & & & \\
\hline & & & & & \\
\hline
\end{tabular}
b.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 706 & & & & & \\
\hline & & & & & \\
\hline & & & & & \\
\hline
\end{tabular}
C.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 7019 & & & & & \\
\hline & & & & & \\
\hline & & & & & \\
\hline
\end{tabular}
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 5034 & & & & & \\
\hline & & & & & \\
\hline & & & & & \\
\hline
\end{tabular}
e.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 40154 & & & & & \\
\hline & & & & & \\
\hline & & & & & \\
\hline
\end{tabular}
f.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 20428 & & & & & \\
\hline & & & & & \\
\hline & & & & & \\
\hline
\end{tabular}
g.
\begin{tabular}{|l|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
hundred \\
thousands
\end{tabular} & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 904539 & & & & & & \\
\hline & & & & & & \\
\hline & & & & & & \\
\hline
\end{tabular}
h.
\begin{tabular}{|l|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
hundred \\
thousands
\end{tabular} & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 406217 & & & & & & \\
\hline & & & & & & \\
\hline & & & & & & \\
\hline
\end{tabular}
G. Find the differences.
54
82 92
a. -5
c. \(\quad-\quad 9\)
e. -53
63
25
58
b. -6
d. \(\quad-\quad 17\)
f. \(\quad-39\)
H. Find the differences.
172
974
956
a. -16
c. -65
e. \(\quad-\quad 392\)
263
b. \(\quad-\quad 59\)
629
754
d. \(\quad-\quad 349\)
f. \(\quad-636\)
I. Find the differences. Check your answers using addition.
83
7317
a. -15 check:
d. \(\quad 5293\) check:
639
45398
b. - 484 check:
e. -2737 check:
c. \(\begin{array}{r}1041 \\ -\quad 436 \\ \hline\end{array}\)
84902
f. - 24290 check:
J. Find the differences.
251
256
970
a. -84
c. \(\quad-\quad 79\)
e. -476
286
427
534
b. -98
d. -328
f. -296
K. Find the differences.
3614
5132
1263
a. -923
b. \(\quad-\quad 747\)
c. -486
\begin{tabular}{|c|c|c|c|c|c|c|c|c|}
\hline \multirow[b]{2}{*}{d.} & & 6163 & \multirow[b]{2}{*}{g.} & \multicolumn{2}{|r|}{71236} & \multirow[b]{2}{*}{j.} & \multirow[b]{2}{*}{-} & \multirow[t]{2}{*}{\[
\begin{aligned}
& 91821 \\
& 76953
\end{aligned}
\]} \\
\hline & - & 2178 & & - & 7852 & & & \\
\hline & & 6311 & & & 34529 & & & 81153 \\
\hline e. & - & 3784 & h. & - & 4868 & k. & - & 43569 \\
\hline & & 7234 & & & 57389 & & & 92763 \\
\hline f. & - & 2659 & i. & - & 3894 & 1. & - & 34387 \\
\hline
\end{tabular}
L. Find the differences.
403
a. \(\quad-16\)
e. -258
8035
f. -652
j. \(\quad-\quad 9238\)
b. \(\quad-\quad 75\)
\(\begin{array}{r}600 \\ \text { c. } \quad-\quad 124 \\ \hline\end{array}\)
d. \(\begin{array}{r}804 \\ -\quad 326 \\ \hline\end{array}\)
h. \(\begin{array}{r}7065 \\ -\quad 6130 \\ \hline\end{array}\)
30642
d. \(\begin{array}{r}804 \\ -\quad 326 \\ \hline\end{array}\)
80965
g. \(\quad-\quad 1135\)
k. \(\quad-\quad 67836\)

O. Use the 5 problem solving steps. Look for key words and patterns to help you choose the correct operation. Estimate the answer using rounded numbers if the numbers have 2 digits or more.
a. Last Friday, 1259 students and 339 parents went to the hockey game. How many students and parents were at the game?
b. The Laerdal Tunnel in Norway is the longest road tunnel in the world. It is 24510 metres long. The Zhongnanshan Tunnel in China is the second longest road tunnel in the world. It is 18040 metres long. How much longer is the Laerdal Tunnel?
c. Li Chiu bought school clothes for her children. She spent \(\$ 46\) at the department store, \(\$ 40\) at the shoe store and \(\$ 78\) at the discount store. How much did Li spend altogether?
d. A truck weighed 4267 kilograms when loaded with dirt. When the truck is empty it weighs 2189 kilograms. How much did the dirt weigh?
P. Find the sum or difference for each question.
a. \(776+634-478=\)
b. \(3714-819+496=\)
c. \(7413-249+382=\)
d. \(6415+5829-1756=\)
Q. Use the 5 problem solving steps. Look for key words and patterns to help you choose the correct operation. Estimate the answer using rounded numbers if the numbers have 2 digits or more. Show all your work.
a. Two weeks ago, Van opened a new bank account and deposited \(\$ 295\). He paid \(\$ 146\) for his gas bill. Van then deposited \(\$ 1632\) in his account. How much money is in his account?
b. Michel has 1532 metres of fencing. He needs to fence his garden which measures 253 metres long and 187 metres wide. Does he have enough fencing? How much fencing will be left over?

\section*{Answers to Unit 3 Review}
A.
a. 34
b. 34
c. 23
d. 53
e. 24
f. 41
B.
a. 572
b. 671
c. 121
d. 275
e. 36
f. 415
C.
a. 724
b. 4053
c. 4383
d. 2832
e. 61214
f. 51314
g. 31192
h. 70261
i. 16103
D.
a. 625
b. 433
c. 2421
d. 6263
e. 55021
f. 51621
E.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 392 & & & 3 & 9 & 2 \\
\hline & & & 3 & 8 & 12 \\
\hline
\end{tabular}
b.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline \(\mathbf{8 2 1}\) & & & 8 & 2 & 1 \\
\hline & & & 8 & \(\mathbf{1}\) & \(\mathbf{1 1}\) \\
\hline
\end{tabular}
c.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 6739 & & 6 & 7 & 3 & 9 \\
\hline & & 6 & 6 & \(\mathbf{1 3}\) & 9 \\
\hline
\end{tabular}
d.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 4528 & & 4 & 5 & 2 & 8 \\
\hline & & 4 & 4 & 12 & 8 \\
\hline
\end{tabular}
e.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline \(\mathbf{2 4 9 8 6}\) & 2 & 4 & 9 & 8 & 6 \\
\hline & 2 & 3 & \(\mathbf{1 9}\) & 8 & 6 \\
\hline
\end{tabular}
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 47182 & 4 & 7 & 1 & 8 & 2 \\
\hline & 4 & 6 & 11 & 8 & 2 \\
\hline
\end{tabular}
F.
a.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 302 & & & 3 & 0 & 2 \\
\hline & & & 2 & 10 & 2 \\
\hline & & & 2 & 9 & 12 \\
\hline
\end{tabular}
b.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 706 & & & 7 & 0 & 6 \\
\hline & & & 6 & 10 & 16 \\
\hline & & & 6 & 9 & 16 \\
\hline
\end{tabular}
C.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 7019 & & 7 & 0 & 1 & 9 \\
\hline & & 6 & 10 & 1 & 9 \\
\hline & & 6 & 9 & 11 & 9 \\
\hline
\end{tabular}
d.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 5034 & & 5 & 0 & 3 & 4 \\
\hline & & 4 & 10 & 3 & 4 \\
\hline & & 4 & 9 & 13 & 4 \\
\hline
\end{tabular}
e.
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 40154 & 4 & 0 & 1 & 5 & 4 \\
\hline & 3 & 10 & 1 & 5 & 4 \\
\hline & 3 & 9 & 11 & 5 & 4 \\
\hline
\end{tabular}
\begin{tabular}{|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 20428 & 2 & 0 & 4 & 2 & 8 \\
\hline & 1 & 10 & 4 & 2 & 8 \\
\hline & 1 & 9 & 14 & 2 & 8 \\
\hline
\end{tabular}
g.
\begin{tabular}{|l|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
hundred \\
thousands
\end{tabular} & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 904539 & 9 & 0 & 4 & 5 & 3 & 9 \\
\hline & 8 & 10 & 4 & 5 & 3 & 9 \\
\hline & 8 & 9 & 14 & 5 & 3 & 9 \\
\hline
\end{tabular}
h.
\begin{tabular}{|l|l|l|l|l|l|l|}
\hline & \begin{tabular}{l} 
hundred \\
thousands
\end{tabular} & \begin{tabular}{l} 
ten \\
thousands
\end{tabular} & thousands & hundreds & tens & ones \\
\hline 406217 & 4 & 0 & 6 & 2 & 1 & 7 \\
\hline & 3 & 10 & 6 & 2 & 1 & 7 \\
\hline & 3 & 9 & 16 & 2 & 1 & 7 \\
\hline
\end{tabular}
G.
a. 49
c. 73
e. 39
b. 57
d. 8
f. 19
H.
a. 156
b. 204
c. 909
d. 280
e. 564
f. 118
I.
a. 68
b. 155
c. 605
d. 2024
e. 42661
f. 60612
J.
a. 167
b. 188
c. 177
d. 99
e. 494
f. 265
K.
a. 2691
b. 4385
c. 777
d. 3985
e. 2527
f. 4575
g. 63384
h. 29661
i. 53495
j. 14868
k. 37584
l. 56476
L.
a. 387
b. 725
c. 476
d. 478
e. 643
f. 7383
g. 2465
h. 935
i. 36884
j. 40888
k. 13129
l. 11005
M.
a. 186
b. 1189
c. 4162
d. 10099
e. 36876
f. 40246
N.
a. \(400-100=300\)
d. \(6000-2000=4000\)

30000
b. \(3500-900=2600\)
e. \(64000-6000=58000\)
c. \(2800-200=2600\)
f. \(50000</\) span \(<-20000=\)
O.
a. 1598 students
c. \(\$ 164\)
b. 6470 metres
d. 2078 kilograms
P.
a. 932
b. 3391
c. 7546
d. 10488
Q.
a. \$1 781
b. Yes, 652 metres leftover

\section*{CONGRATULATIONS!!}

Now you have finished Unit 3.
TEST TIME!
Ask your instructor for the Practice Test for this unit.
Once you've done the practice test, you need to do the unit 3 test.
Again, ask your instructor for this.
Good luck!

\section*{Unit 4: Multiplication}

\section*{Topic A: Introduction and Multiplication Facts}

Multiplication is a fast way to add. Multiplication is used when the amounts to be added are the same.


How many groups are there? 7
7 groups of \(3=21\)
This can be written as a multiplication equation.
\(7 \times 3=21\)
X is the sign that means to multiply. We often say times for this multiplication sign.


4 groups of \(2=8\)
\(4 \times 2=8\) says: 4 times 2 equals 8 or 4 multiplied by 2 equals 8
The result of a multiplication is called the product.
The numbers that are multiplied together are called factors.
\(7 \times 3=21\) The factors are 7 and 3.
The product is 21 .

Exercise One

For each drawing, write the addition equation and find the total. Then write the multiplication equation that describes the same drawing and find the product. Check your work using the answer key at the end of the exercise.
\begin{tabular}{|c|c|c|c|}
\hline \# & Drawing & Addition equation & Multiplication equation \\
\hline a. &  & \(4+4+4=12\) & \(3 \times 4=12\) \\
\hline b. & OOOOEO OOOOEO & & \\
\hline c. &  & & \\
\hline d. & \begin{tabular}{l}
(20®0) \\
(2)(2): \\
(2)®(2) \\
(2)(2):
\end{tabular} & & \\
\hline e. &  & & \\
\hline
\end{tabular}


\section*{Answers to Exercise One}
a. \(4+4+4=12, \quad 3 \times 4=12\)
b. \(6+6=12,2 \times 6=12\)
c. \(3+3+3+3+3=15, \quad 5 \times 3=15\)
d. \(5+5+5+5=20, \quad 4 \times 5=20\)
e. \(8+8+8+8=32, \quad 4 \times 8=32\)

\section*{Exercise Two}

For each drawing, write the addition equation and find the total. Then write the multiplication equation that describes the same drawing and find the product. Check your work using the answer key at the end of the exercise.
\begin{tabular}{|c|c|c|c|}
\hline \＃ & Drawing & Addition Equation & Multiplication Equation \\
\hline a． & \[
\begin{array}{ll}
\Delta \Delta \Delta \Delta & \Delta \Delta \Delta \Delta \\
\Delta \Delta \Delta \Delta & \Delta \Delta \Delta \Delta \\
\Delta \Delta \Delta \Delta & \Delta \Delta \Delta \Delta
\end{array}
\] & & \\
\hline b． &  & & \\
\hline c． & \begin{tabular}{l}
 － \\
 \\

\end{tabular} & & \\
\hline d． & \begin{tabular}{l}
 \\
 \\
 \\
 \\

\end{tabular} & & \\
\hline e． & \begin{tabular}{ll}
000000 & 000000 \\
000000 & 000000 \\
000000 & 000000 \\
000000 & 000000 \\
000000 &
\end{tabular} & & \\
\hline
\end{tabular}

\section*{Answers to Exercise Two}
a． \(4+4+4+4+4+4=24, \quad 4 \times 6=24\)
b． \(3+3+3+3+3+3+3=21, \quad 3 \times 7=21\)
c． \(5+5+5+5+5+5+5+5=40, \quad 5 \times 8=40\)
d． \(7+7+7+7+7=35,7 \times 5=35\)
e． \(6+6+6+6+6+6+6+6+6=54, \quad 6 \times 9=54\)

Look at the examples. Complete the chart. Check your work using the answer key at the end of the exercise.
Example A: \(2 \times 3\) is read as -two times threell and means \(3+3\)
\(3 \times 2\) is read as -three times threell and means \(2+2+2\)
\begin{tabular}{|l|l|l|}
\hline Equation & "is read as" & means \\
\hline \(5 \times 7\) & five times seven & \\
\hline \(2 \times 5\) & & \(7+7+7+7+7\) \\
\hline \(3 \times 4\) & & \\
\hline \(5 \times 2\) & & \\
\hline \(4 \times 8\) & & \\
\hline \(2 \times 7\) & & \\
\hline \(3 \times 5\) & & \\
\hline \(2 \times 8\) & & \\
\hline \(3 \times 9\) & & \\
\hline \(6 \times 4\) & & \\
\hline \(7 \times 3\) & & \\
\hline
\end{tabular}

\section*{Answers to Exercise Three}
\begin{tabular}{|l|l|l|}
\hline Equation & "is read as" & means \\
\hline \(\mathbf{5} \times \mathbf{7}\) & five times seven & \(7+7+7+7+\mathbf{7}\) \\
\hline \(\mathbf{2} \times \mathbf{5}\) & two times five & \(5+5\) \\
\hline \(\mathbf{3} \times \mathbf{4}\) & three times four & \(4+4+4\) \\
\hline \(\mathbf{5} \times \mathbf{2}\) & five times two & \(2+2+2+2+2\) \\
\hline \(\mathbf{4} \times \mathbf{8}\) & four times eight & \(8+8+8+8\) \\
\hline \(\mathbf{2} \times \mathbf{7}\) & two times seven & \(7+7\) \\
\hline \(\mathbf{3} \times \mathbf{5}\) & three times five & \(5+5+5\) \\
\hline \(\mathbf{2} \times \mathbf{8}\) & two times eight & \(8+8\) \\
\hline \(\mathbf{3} \times \mathbf{9}\) & three times nine & \(9+9+9\) \\
\hline \(\mathbf{6} \times \mathbf{4}\) & six times four & \(4+4+4+4+4+4\) \\
\hline \(\mathbf{7} \times \mathbf{3}\) & seven times three & \(3+3+3+3+3+3+3\) \\
\hline
\end{tabular}

Adding will give the answer to multiplication questions but it is very slow, especially if the numbers are large. The times tables are the multiplication facts. You may need to memorize the times tables. You will use the times tables for multiplying, dividing, and working with fractions.
\[
0 \times \text { any number }=0
\]
any number \(\times 0=0\)

Topic A: Introduction and Multiplication Facts 203
\begin{tabular}{|l|l|}
\hline \(0 \times 0=0\) & \(0 \times 0=0\) \\
\hline \(0 \times 1=0\) & \(1 \times 0=0\) \\
\hline \(0 \times 2=0\) & \(2 \times 0=0\) \\
\hline \(0 \times 3=0\) & \(3 \times 0=0\) \\
\hline \(0 \times 4=0\) & \(4 \times 0=0\) \\
\hline \(0 \times 5=0\) & \(5 \times 0=0\) \\
\hline \(0 \times 6=0\) & \(6 \times 0=0\) \\
\hline \(0 \times 7=0\) & \(7 \times 0=0\) \\
\hline \(0 \times 8=0\) & \(8 \times 0=0\) \\
\hline \(0 \times 9=0\) & \(9 \times 0=0\) \\
\hline \(0 \times 10=0\) & \(10 \times 0=0\) \\
\hline
\end{tabular}
\(1 \times\) any number \(=\) that number
\begin{tabular}{|l|}
\hline \(1 \times 0=0\) \\
\hline \(1 \times 1=1\) \\
\hline \(1 \times 2=2\) \\
\hline \(1 \times 3=3\) \\
\hline \(1 \times 4=4\) \\
\hline \(1 \times 5=5\) \\
\hline \(1 \times 6=6\) \\
\hline \(1 \times 7=7\) \\
\hline \(1 \times 8=8\) \\
\hline \(1 \times 9=9\) \\
\hline \(1 \times 10=10\) \\
\hline
\end{tabular}

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\begin{tabular}{|l|l|}
\hline \(0+0=0\) & \(2 \times 0=0\) \\
\hline \(1+1=2\) & \(2 \times 1=2\) \\
\hline \(2+2=4\) & \(2 \times 2=4\) \\
\hline \(3+3=6\) & \(2 \times 3=6\) \\
\hline \(4+4=8\) & \(2 \times 4=8\) \\
\hline \(5+5=10\) & \(2 \times 5=10\) \\
\hline \(6+6=12\) & \(2 \times 6=12\) \\
\hline \(7+7=14\) & \(2 \times 7=14\) \\
\hline \(8+8=16\) & \(2 \times 8=16\) \\
\hline \(9+9=18\) & \(2 \times 9=19\) \\
\hline \(10+10=20\) & \(2 \times 10=20\) \\
\hline
\end{tabular}

Can you see a pattern? If you forget a multiplication fact with 2, you can just add.
Example: \(2 \times 4=4+4=8\)
\(2 \times 7=7+7=14\)
The three times table is special. The digits of each product adds up to 3,6 or 9 . You will know your answer is right if you add the digits of the product (the answer for a multiplication question) and the answer is 3,6 or 9 .
\begin{tabular}{|l|l|}
\hline \(3 \times 0=0\) & \\
\hline \(3 \times 1=3\) & 3 \\
\hline \(3 \times 2=6\) & 6 \\
\hline \(3 \times 3=9\) & 9 \\
\hline \(3 \times 4=12\) & \(12 » 1+2=3\) \\
\hline \(3 \times 5=15\) & \(15 » 1+5=6\) \\
\hline \(3 \times 6=18\) & \(18 » 1+8=9\) \\
\hline \(3 \times 7=21\) & \(21 » 2+1=3\) \\
\hline \(3 \times 8=24\) & \(24 » 2+4=6\) \\
\hline \(3 \times 9=27\) & \(27 » 2+7=9\) \\
\hline \(3 \times 10=30\) & \(30 » 3+0=3\) \\
\hline
\end{tabular}

Check out your multiplication facts by doing this exercise as quickly as possible. Find the product. This exercise includes the zero to three times tables. Check your work using the answer key at the end of the exercise. Then, make a list of any multiplication facts you do not know or which are slow - practice them.

2
a. \(\times 2\)

3
b. \(\times 3\)
j. \(\times 8\)

3
k. \(\times 4\)
c. \(\times 4\)
.

0
d. \(\times 1\)

1
e. \(\times 7\)
m. \(\times 5\)
u. \(\times 9\)

2
0
ก. \(\times 7\)
f. \(\times 3\)

0
2
o. \(\times 4\)
g. \(\times 4\)

3
h. \(\quad \times 1\)
p. \(\times 9\)

1
q. \(\times 1\)

2
r. \(\times 1\)

0
s. \(\times 3\)

3
t. \(\times 2\)

3

ก. \(\times 7\)
v. \(\times 10\)

2
w. \(\times 8\)

0
?
2 3
y. \(\times 9\)
aa. \(\times 10\)
0
z. \(\times 9\)
ab. \(\times 2\)

\section*{Answers to Exercise Four}
a. 4
k. 12
u. 27
b. 9
l. 10
c. 4
m. 15
v. 10
d. 0
n. 0
o. 8
y. 18
e. 7
p. 9
z. 0
g. 0
q. 1
aa. 30
h. 3
r. 2
ab. 2
i. 0
s. 0
j. 8
t. 6

\section*{Need Extra Practice?}

\section*{Domino Practice - Find a partner and ask your instructor for double twelve dominoes.}

Use only the following dominoes: \(0-0\) to \(0-10\)
1-1 to 1-10
2-2 to 2-10
3-3 to 3-10
Turn over the dominoes.
Flip a domino and multiply the two numbers.
Example:


This would be \(2 \times 6\)
If you answer correctly, keep the domino.
If you answer incorrectly, flip the domino over.

Study the four times tables below.
\begin{tabular}{|l|}
\hline \(4 \times 0=0\) \\
\hline \(4 \times 1=4\) \\
\hline \(4 \times 2=8\) \\
\hline \(4 \times 3=12\) \\
\hline \(4 \times 4=16\) \\
\hline \(4 \times 5=20\) \\
\hline \(4 \times 6=24\) \\
\hline \(4 \times 7=28\) \\
\hline \(4 \times 8=32\) \\
\hline \(4 \times 9=36\) \\
\hline \(4 \times 10=40\) \\
\hline
\end{tabular}

The fives times table is special. If you are multiplying by an even number, the product ends in zero. If you are multiplying by an odd number, the product ends in five.
\begin{tabular}{|l|}
\hline \(5 \times 0=0\) \\
\hline \(5 \times 1=5\) \\
\hline \(5 \times 2=10\) \\
\hline \(5 \times 3=15\) \\
\hline \(5 \times 4=20\) \\
\hline \(5 \times 5=25\) \\
\hline \(5 \times 6=30\) \\
\hline \(5 \times 7=35\) \\
\hline \(5 \times 8=40\) \\
\hline \(5 \times 9=45\) \\
\hline \(5 \times 10=50\) \\
\hline
\end{tabular}

The products for the odd numbers \(1,3,5,7\) and 9 end in five.
The products for the even numbers \(2,4,6,8\) and 10 end in 10 .
Study the six times tables below.
\begin{tabular}{|l|}
\hline \(6 \times 0=0\) \\
\hline \(6 \times 1=6\) \\
\hline \(6 \times 2=12\) \\
\hline \(6 \times 3=18\) \\
\hline \(6 \times 4=24\) \\
\hline \(6 \times 5=30\) \\
\hline \(6 \times 6=36\) \\
\hline \(6 \times 7=42\) \\
\hline \(6 \times 8=48\) \\
\hline \(6 \times 9=54\) \\
\hline \(6 \times 10=60\) \\
\hline
\end{tabular}

Check out your multiplication facts by doing this exercise as quickly as possible. Find the product. This exercise includes the four to six times tables. Check your work using the answer key at the end of the exercise. Then, make a list of any multiplication facts you do not know or which are slow - practice them.
5
4
5
a. \(\quad \times 6\)
b. \(\begin{array}{r}6 \\ \times 1 \\ \hline\end{array}\)

i. \(\times 4\)

5
j. \(\times 6\)

4
c. \(\quad \times 7\)

5
d. \(\times 7\)

6
e. \(\times 10\)

4
f. \(\times 2\)

ก. \(\times 5\)

5
g. \(\times 4\)
o. \(\times 2\)

6
p. \(\times 0\)
h. \(\times 3\)
q. \(\quad \times 7\) 6
r. \(\times 6\)

4
s. \(\times 0\)

5
t. \(\times 10\)

4
u. \(\times 9\)

\section*{5}
v. \(\times 1\)

6
w. \(\times 5\)

4
x. \(\times 3\)
5
y. \(\times 9\)
6
z. \(\times 2\)

\section*{Answers to Exercise Five}
a. 30
k. 24
u. 36
b. 6
l. 28
C. 28
m. 54
v. 5
d. 35
n. 20
o. 10
p. 0
q. 35
aa. 4
g. 20
r. 36
ab. 0
h. 18
s. 0
j. 30
t. 50

\section*{Need Extra Practice?}

\section*{Card Practice - Find a partner and ask your instructor for a deck of cards.}

Take out all the jacks, queens and kings. You will only need the aces to tens.
Choose a times table to practice.
Example: to practice the 5 times table
- Choose a single 5 card and place it face up.
- Shuffle the remainder of the cards.
- From the shuffled cards, place one card face up next to the five.
- Multiply. Have your partner check your answer.
- If the answer is correct, leave it on the pile.
- If the answer is incorrect, place the card in front of you.
- Keep turning cards over until there are no cards left.
- Reshuffle any cards in front of you.
- Place a card on the pile and multiply.
- When all the cards are in the pile, you are done.
- Choose a different times table to practice and start again.

\section*{Exercise Six}

Check out your multiplication facts by doing this exercise as quickly as possible. Find the product. This exercise includes the zero to six times tables. Check your work using the answer key at the end of the exercise. Then, make a list of any multiplication facts you do not know or which are slow - practice them.
6
2
5
a. \(\times 3\)
f. \(\times 3\)
k. \(\times 8\)
5
3
b. \(\times 7\)
g. \(\times 3\)
1. \(\times 9\)
0
4
c. \(\times 2\)
h. \(\times 2\)
m. \(\times 1\)
6
d. \(\times 4\)
i. \(\times 2\)
n. \(\times 4\)
1
6
3
e. \(\times 5\)
j. \(\times 7\)
o. \(\times 10\)
2
p. \(\times 5\)

1
q. \(\times 3\)
\(\begin{array}{r}3 \\ \text { r. } \quad 5 \\ \hline\end{array}\)

4
s. \(\times 6\)

6
t. \(\times 7\)

6
u. \(\times 5\)
aa. \(\times 0\)

\section*{Answers to Exercise Six}
a. 18
l. 36
b. 35
m. 5
c. 0
ก. 8
d. 24
o. 30
e. 5
p. 10
f. 6
g. 9
q. 3
r. 15
h. 8
i. 4
s. 24
t. 42
j. 42
u. 30
k. 40
v. 12
w. 0
x. 40
y. 9
z. 6
aa. 0
ab. 54
ac. 36
ad. 0
ae. 21
af. 18

1
a. \(\times 1\)

6
b. \(\times 10\)

4
c. \(\times 1\)

3
d. \(\times 0\)

5
e. \(\times 7\)

4
f. \(\times 10\)

ก. \(\times 8\)

2
g. \(\times 1\)
o. \(\times 7\) 4
p. \(\times 5\)
x. \(\times 8\)

6
y. \(\times 6\)

5
z. \(\times 5\)

3
aa. \(\quad \times 6\)
ad. \(\times 6\)

\section*{3}
ae. \(\times 7\)

2
af. \(\quad \times 9\)

\section*{Answers to Exercise Seven}
a. 1
1. 0
w. 28
b. 60
m. 3
c. 4
n. 40
d. 0
o. 42
e. 35
p. 20
f. 40
q. 30
ab. 48
g. 2
r. 30
ac. 12
h. 7
s. 0
ad. 24
i. 0
t. 10
ae. 21
j. 24
u. 30
af. 18

Study the seven times table below.
\begin{tabular}{|l|}
\hline \(7 \times 0=0\) \\
\hline \(7 \times 1=7\) \\
\hline \(7 \times 2=14\) \\
\hline \(7 \times 3=21\) \\
\hline \(7 \times 4=28\) \\
\hline \(7 \times 5=35\) \\
\hline \(7 \times 6=42\) \\
\hline \(7 \times 7=49\) \\
\hline \(7 \times 8=56\) \\
\hline \(7 \times 9=63\) \\
\hline \(7 \times 10=70\) \\
\hline
\end{tabular}

Study the eight times table below.
\begin{tabular}{|l|}
\hline \(8 \times 0=0\) \\
\hline \(8 \times 1=8\) \\
\hline \(8 \times 2=16\) \\
\hline \(8 \times 3=24\) \\
\hline \(8 \times 4=32\) \\
\hline \(8 \times 5=40\) \\
\hline \(8 \times 6=48\) \\
\hline \(8 \times 7=56\) \\
\hline \(8 \times 8=64\) \\
\hline \(8 \times 9=72\) \\
\hline \(8 \times 10=80\) \\
\hline
\end{tabular}

The nines times table is special. The digits of every product add up to nine. Also the first digit in the product is one less than the number you are multiplying.
\begin{tabular}{|l|l|}
\hline \(9 \times 0=0\) & \\
\hline \(9 \times 1=9\) & 9 \\
\hline \(9 \times 2=18\) & \(18 » 1+8=9\) \\
\hline \(9 \times 3=27\) & \(27 » 2+7=9\) \\
\hline \(9 \times 4=36\) & \(36 » 3+6=9\) \\
\hline \(9 \times 5=45\) & \(45 » 4+5=9\) \\
\hline \(9 \times 6=54\) & \(54 » 5+4=9\) \\
\hline \(9 \times 7=63\) & \(63 » 6+3=9\) \\
\hline \(9 \times 8=72\) & \(72 » 7+2=9\) \\
\hline \(9 \times 9=81\) & \(81 » 8+1=9\) \\
\hline \(9 \times 10=90\) & \(90 » 9+0=9\) \\
\hline
\end{tabular}

Exercise Eight

Check out your multiplication facts by doing this exercise as quickly as possible. Find the product. This exercise includes the seven to nine times tables.
7
9
8
a. \(\times 4\)
e. \(\times 6\)
i. \(\times 6\)
b. \(\begin{array}{r}8 \\ \times 3\end{array}\)
7
f. \(\times 0\)
j. \(\times 2\)
9
8
7
c. \(\times 0\)
g. \(\times 8\)
k. \(\times 9\)
d. \(\begin{array}{r}7 \\ \times 2 \\ \hline\end{array}\)
\[
9
\]
h. \(\times 1\)
1. \(\times 0\)
9
m. \(\times 4\)
s. \(\times 3\)
7
7
n. \(\times 7\)
t. \(\times 10\)
\(\begin{array}{r}8 \\ \text { z. } \quad \times 5 \\ \hline\end{array}\)
8
o. \(\times 1\)
u. \(\times 8\)

9
aа. \(\quad \times 9\)
p. \(\begin{array}{r}9 \\ \times 10 \\ \hline\end{array}\)
v. \(\times 5\)
ab. \(\times 8\)
7
q. \(\times 5\)
w. \(\times 1\)

8
8
r. \(\quad \times 4\)
x. \(\quad \times 2\)

\section*{Answers to Exercise Eight}
a. 28
b. 24
c. 0
d. 14
e. 54
f. 0
g. 64
h. 9
i. 48
j. 18
k. 63
l. 0
m. 36
n. 49
o. 8
p. 90
q. 35
r. 32
s. 27
t. 70
u. 64
v. 45
w. 7
x. 16
y. 21

\section*{Exercise Nine}

Check out your multiplication facts by doing this exercise as quickly as possible. Find the product. This exercise includes the seven to nine times tables. Check your work using the answer key at the end of the exercise. Then, make a list of any multiplication facts you do not know or which are slow - practice them.
9
9
9
a. \(\times 0\)

8
b. \(\quad \times 7\)
j. \(\times 10\)

7
c. \(\times 5\)

9
d. \(\times 5\)

7
e. \(\times 6\)

9
f. \(\times 8\)

ก. \(\times 7\)
m. \(\times 6\)

7
ก. \(\times 7\)

8
9
o. \(\times 3\)
g. \(\times 5\)

7
h. \(\times 8\)
p. \(\times 9\)
q. \(\times 4\) 8
r. \(\times 3\)

7
s. \(\quad \times 3\)

9
t. \(\times 8\)

8
u. \(\times 8\)

\section*{9}
v. \(\times 9\) 7
w. \(\times 2\) 8
x. \(\quad \times 2\)
7
y. \(\times 9\)
aа. \(\times 6\)
8
z. \(\times 1\)
ab. \(\begin{array}{r}7 \\ \times 0 \\ \hline\end{array}\)

\section*{Answers to Exercise Nine}
a. 0
k. 28
u. 64
b. 56
l. 90
v. 81
c. 35
m. 48
w. 14
d. 45
n. 49
x. 16
e. 42
o. 27
y. 63
f. 72
p. 72
z. 8
g. 40
q. 36
a. 54
h. 56
r. 24
ab. 0
i. 72
s. 21
j. 80
t. 72

\section*{Need Extra Practice?}

\section*{Domino Practice - Find a partner and ask your instructor for double twelves dominoes.}

Use only the following dominoes: 1-0 to 0-10
1-2 to 1-10
2-2 to 2-10
3-3 to 3-10
4-4 to 4-10
5-5 to 5-10
6-6 to 6-10
7-7 to 7-10
8-8 to 8-10

9-9 to 9-10
10-10
Turn over the dominoes
Flip a domino and multiply the two numbers
Example:


This would be \(2 \times 6\)
If you answer correctly, keep the domino.

\section*{Exercise Ten}

Check out your multiplication facts by doing this exercise as quickly as possible.
5
6
9
a. \(\times 4\)
e. \(\times 3\)
i. \(\times 5\)
7
7
f. \(\times 6\)
j. \(\times 1\)
\(\begin{array}{r}6 \\ \text { c. } \quad \times 5 \\ \hline\end{array}\)
2
k. \(\begin{array}{r}7 \\ \times 6 \\ \hline\end{array}\)
d. \(\begin{array}{r}9 \\ \times 7 \\ \hline\end{array}\)
g. \(\times 1\)
4
9
d. \(\quad \times 7\)
h. \(\times 3\)
1. \(\times 2\)

4
m. \(\times 1\)
n. \(\begin{array}{r}6 \\ \times 2 \\ \hline\end{array}\)

9
o. \(\times 9\)

5
p. \(\times 3\)

9
q. \(\times 4\)

8
r. \(\times 5\)
\(\begin{array}{r}7 \\ \text { s. } \quad 4 \\ \hline\end{array}\)
\(\begin{array}{r}7 \\ \text { s. } \quad 4 \\ \hline\end{array}\)
\(\qquad\)
w. \(\times 8\)

9
x. \(\quad \times 8\)

8
y. \(\times 4\)

7
z. \(\times 7\)

\section*{Answers to Exercise Ten}
a. 20
h. 12
o. 81
b. 21
i. 45
p. 15
c. 30
j. 3
q. 36
d. 63
k. 42
e. 18
l. 18
f. 42
m. 4
g. 2
ก. 12
r. 40
s. 28
t. 6
.
v. 10
z. 49
ad. 30
w. 64
a. 8
ae. 7
x. 72
ab. 12
af. 0
y. 32
ac. 32

Make a list of any errors that you have made and of the facts that you had to really think about.
As you know, it is very important to memorize the times tables. Use the times table chart on the next page until you have all the multiplication facts memorized. It is better to look up the right answer than use the wrong product. Finding the right product and saying the facts to yourself will help you learn.

\section*{Times Table Chart}

Let's say you do not know the product of \(8 \times 9\).
- Find the first factor (8) in the column at the left. Find the second factor (9) in the top row.
- Go across the row from the 8 and straight down the column from the 9.
- The lines meet at the product which is 72 ... Try it! Now try finding the products of some other multiplication facts.

Times Table Chart
\begin{tabular}{|l|l|l|l|l|l|l|l|l|l|l|l|}
\hline\(\times\) & \(\mathbf{0}\) & \(\mathbf{1}\) & \(\mathbf{2}\) & \(\mathbf{3}\) & \(\mathbf{4}\) & \(\mathbf{5}\) & \(\mathbf{6}\) & \(\mathbf{7}\) & \(\mathbf{8}\) & \(\mathbf{9}\) & \(\mathbf{1 0}\) \\
\hline \(\mathbf{0}\) & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\hline \(\mathbf{1}\) & 0 & 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 & 10 \\
\hline \(\mathbf{2}\) & 0 & 2 & 4 & 6 & 8 & 10 & 12 & 14 & 16 & 18 & 20 \\
\hline \(\mathbf{3}\) & 0 & 3 & 6 & 9 & 12 & 15 & 18 & 21 & 24 & 27 & 30 \\
\hline \(\mathbf{4}\) & 0 & 4 & 8 & 12 & 16 & 20 & 24 & 28 & 32 & 36 & 40 \\
\hline \(\mathbf{5}\) & 0 & 5 & 10 & 15 & 20 & 25 & 30 & 35 & 40 & 45 & 50 \\
\hline \(\mathbf{6}\) & 0 & 6 & 12 & 18 & 24 & 30 & 36 & 42 & 48 & 54 & 60 \\
\hline \(\mathbf{7}\) & 0 & 7 & 14 & 21 & 28 & 35 & 42 & 49 & 56 & 63 & 70 \\
\hline \(\mathbf{8}\) & 0 & 8 & 16 & 24 & 32 & 40 & 48 & 56 & 64 & 72 & 80 \\
\hline \(\mathbf{9}\) & 0 & 9 & 18 & 27 & 36 & 45 & 54 & 63 & 72 & 81 & 90 \\
\hline \(\mathbf{1 0}\) & 0 & 10 & 20 & 30 & 40 & 50 & 60 & 70 & 80 & 90 & 100 \\
\hline
\end{tabular}

Times Tables are very difficult to memorize. Here's a technique that may help you to learn them.
An instructor used this technique to teach his students the times tables. It does require you to do some work and will take some time. But, if you are willing, you will learn them. Here's how it works.

Most people can only memorize three things; as soon as they try to memorize a fourth thing, they lose one of the first three. So, instead of trying to memorize the complete times table (which is 121 things), just do three.
- \(9 \times 9=81\)
- \(8 \times 8=64\)
- \(8 \times 9=72\)

If you know any of these already, for example, you automatically know that \(9 \times 9=81\), choose another one, like \(7 \times 7=49\).

Write these three on small cards or pieces of paper in three different ways:
\[
9 \times 9=81 \quad 9 \times 9=\_\quad 9 \times \_=81
\]
\[
8 \times 8=64 \quad 8 \times 8=\_\quad 8 \times \_=64
\]
\[
8 \times 9=72 \quad 8 \times 9=\_8 \times \_=72
\]

Note: \(8 \times 9=72\) and \(9 \times 8=72\). Both are the same, so when you learn \(8 \times 9\) you will also know \(9 \times 8\). You will have learned part of the 8 times table and part of the 9 times table.

Do a number of these and stick them up around your house - over the kitchen sink, on your bathroom mirror, on your closet door, etc. Then, every time you see one of these, run through it in your mind. It only takes about 5 seconds each time. After about a week or two, you will have learned these three. If anyone were to ask you what 99 was, you would automatically know that it is 81 . You wouldn't have to figure it out; you would know it.

And, once you know it, you will never forget it.
Once you have master these three, do three more, like \(7 \times 7=49,7 \times 8=56,7 \times 9=63\). Again, make up small cards and put them all over your house. In another week or so, you will have learned these and can do another three.

If you are willing to do the work, you will learn your times tables. And, once you learn them, you will never forget them. That will make your work in mathematics much easier, and maybe even more fun. Try it! It does work.

\section*{Multiplying Across}

So far you have only been multiplying numbers when they are up and down or vertical.

Example: \(4 \times 5=20\)
Another way to multiply numbers is across or horizontally.
Example: \(4 \times 5=20\)
In math, sometimes you will need to work from left to right.

\section*{Exercise Eleven}

Practice multiplying across or horizontally. Find the product. This exercise includes the zero to nine times tables.
a. \(2 \times 6=\)
b. \(5 \times 4=\)
c. \(7 \times 3=\)
d. \(3 \times 6=\)
e. \(8 \times 5=\)
f. \(4 \times 7=\)
g. \(9 \times 2=\)
h. \(6 \times 5=\)
i. \(5 \times 3=\)
j. \(3 \times 8=\)
k. \(7 \times 7=\)
l. \(2 \times 9=\)
m. \(4 \times 6=\)
n. \(6 \times 9=\)
o. \(8 \times 8=\)
p. \(9 \times 4=\)
q. \(3 \times 9=\)
r. \(4 \times 4=\)
s. \(6 \times 7=\)
t. \(9 \times 6=\)

\section*{Answers to Exercise Eleven}
a. 12
b. 20
c. 21
d. 18
e. 40
f. 28
g. 18
h. 30
i. 15
j. 24
k. 49
l. 18
m. 24
n. 54
o. 64
p. 36
q. 27
r. 16
s. 42
t. 54

\section*{Topic A: Self-Test}

Mark /20 Aim 17/20
A. Find the products. Be sure to check your answers. (16 marks)
3
3
3
a. \(\times 3\)
g. \(\times 9\)
m. \(\times 7\)

4
6
h. \(\quad \times 9\)
n. \(\times 6\)
b. \(\times 9\)

6
7
i. \(\quad \times 7\)
o. \(\quad \times 9\)
c. \(\times 4\)

7
d. \(\times 8\)
j. \(\quad \times 8\)
p. \(\times 7\)
8
8
e. \(\times 3\)
k. \(\quad \times 9\)
9
f. \(\times 5\)
1. \(\times 5\)
B. Find the products. Be sure to check your answers. (4 marks)
a. \(7 \times 5=\)
b. \(8 \times 6=\)
c. \(9 \times 8=\)
d. \(7 \times 4=\)

\section*{Answers to Topic A Self-Test}
A.
a. 9
b. 36
c. 24
d. 56
e. 24
f. 45
g. 27
h. 54
i. 49
j. 32
k. 72
l. 10
m. 21
n. 24
o. 45
p. 42
B.
a. 35
b. 48
c. 72

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d. 28

\section*{Topic B: Multiplying by 10, 100 and 1000}

When multiplying by \(10,100,1000,10000\), etc., place as many zeros to the right of the number as there are zeros in the \(10,100,1000\), etc..

To multiply by 10 put one zero after the number. To multiply by 100 put two zeros after the number.
To multiply by 1000 put three zeros after the number.
Example: \(4 \times 100=\)
100 has two zeroes. Put two zeroes after the number.
\(4 \times 100=400\)

\section*{Exercise One}
a. \(10 \times 2=\)
m. \(4 \times 1000=\)
b. \(9 \times 100=\)
n. \(10 \times 0=\)
c. \(100 \times 3=\)
o. \(100 \times 8=\)
d. \(1 \times 1000=\)
p. \(3 \times 1000=\)
e. \(6 \times 100=\)
q. \(10 \times 5=\)
f. \(10 \times 7=\)
r. \(7 \times 1000=\)
g. \(100 \times 10=\)
s. \(1000 \times 6=\)
h. \(2 \times 10=\)
t. \(8 \times 10=\)
i. \(5 \times 10=\)
u. \(100 \times 4=\)
j. \(1000 \times 1=\)
v. \(1 \times 100=\)
k. \(0 \times 10=\)
พ. \(1000 \times 3=\)
l. \(1000 \times 9=\)
x. \(10 \times 100=\)

\section*{Answers to Exercise One}
a. 20
b. 900
c. 300
d. 1000
e. 600
f. 70
g. 1000
h. 20
i. 50
j. 1000
k. 0
l. 9000
m. 4000
n. 0
o. 800
p. 3000
q. 50
r. 7000
s. 6000
t. 80
u. 400
v. 100
w. 3000
x. 1000

\section*{Exercise Two}

Find the products. Check your work using the answer key at the end of the exercise.
a. \(100 \times 9=\)
m. \(9 \times 10=\)
b. \(10 \times 1000=\)
n. \(10 \times 100=\)
c. \(10 \times 9=\)
o. \(10 \times 6=\)
d. \(1000 \times 8=\)
e. \(6 \times 10=\)
p. \(5 \times 100=\)
f. \(100 \times 0=\)
q. \(1 \times 10=\)
g. \(3 \times 100=\)
r. \(9 \times 1000=\)
h. \(10 \times 1=\)
i. \(100 \times 1=\)
s. \(100 \times 6=\)
. \(5 \times 1000=\)
k. \(8 \times 100=\)
l. \(1000 \times 4=\)
t. \(10 \times 8=\)
u. \(3 \times 10=\)
v. \(1000 \times 0=\)
w. \(2 \times 1000=\)
x. \(1000 \times 7=\)

\section*{Answers to Exercise Two}
a. 900
b. 10000
c. 90
d. 8000
e. 60
f. 0
g. 300
h. 10
i. 100
j. 5000
k. 800
l. 4000
m. 90
n. 1000
o. 60
p. 500
q. 10
r. 9000
s. 600
t. 80
u. 30
v. 0
w. 2000
x. 7000

\section*{Topic B: Self-Test}

Mark /18 Aim 15/18
A. Find the products. Be sure to check your answers. (6 marks)
a. \(3 \times 10=\)
b. \(6 \times 100=\)
c. \(8 \times 1000=\)
d. \(7 \times 1000=\)
e. \(4 \times 100=\)
f. \(5 \times 10=\)
B. Find the products. Be sure to check your answers. (6 marks)
a. \(10 \times 10=\)
b. \(1000 \times 9=\)
c. \(100 \times 10=\)
d. \(100 \times 2=\)
e. \(10 \times 0=\)
f. \(1000 \times 4=\)
C. Find the products. Be sure to check your answers. (6 marks)
a. \(10 \times 6=\)
b. \(1000 \times 7=\)
c. \(100 \times 4=\)
d. \(5 \times 1000=\)
e. \(8 \times 10=\)
f. \(10 \times 100=\)

\section*{Answers to Topic B Self- Test}
A.
a. 30
a. 100
b. 600
b. 9000
c. 8000
c. 1000
d. 7000
d. 200
e. 400
f. 50
B.
e. 0
f. 4000

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C.
a. 60
b. 7000
c. 400
d. 5000
e. 80
f. 1000

\section*{Topic C: Word Problems}

Learning multiplication facts is very important. Once you know them all, you can use them to solve word problems.

Words such as product, altogether and in all tell you may need to multiply the numbers. Look for these words when reading and underline them before trying to solve a problem. Circle the information that is given.

Example: Mr. Wong rides his bicycle 6 kilometres every day. How far will he ride altogether in 9 days? Mr Wong rides his bicycle 6 kilometres every day. How far will he ride altogether in 9 days? You have circled 6 kilometres and 9 days. This is the information you will use to find the answer. You have underlined How far will he ride. These words tell you to multiply.

6 kilometres \(\times 9\) days \(=54\)
Mr. Wong will ride 54 kilometres in 9 days.

Exercise One

Solve each of the following word problems. Be sure to underline the words that tell you to multiply. Circle) the information that is given. Have your instructor check your underlining and circling.
a. There are 5 rows of mailboxes in an apartment building. There are 7 mailboxes in each row. How many mailboxes are there in all?
b. At the grocery store, there are 8 cans of corn in each row. There are 6 rows of corn. How many cans of corn are there altogether?
c. There are 7 days in a week. How many days are there in 4 weeks?

\section*{Answers to Exercise One}
a. 35 mailboxes
b. 48 cans
c. 28 days

\section*{Area}

Area means the surface that is inside a shape. The units of measure of area are always square units (meaning having both length and width).

\section*{Rectangle}

\section*{length}


To find the area of a rectangle, multiply length x width.

\section*{Example A}


To find the area of the rectangle multiply length \(\times\) width.
Area \(=\) length \(\times\) width
Area \(=8\) metres \(\times 3\) metres
Area \(=24\) square metres

Example B

\section*{4 centimetres}


To find the area of the rectangle multiply length x width.
Area \(=\) length \(\times\) width
Area \(=4\) centimetres \(\times 7\) centimetres
Area \(=28\) square centimetres

\section*{Square}


To find the area of a square multiply side \(\times\) side.

9 metres


To find the area of the square multiply side \(\times\) side.

Area \(=\) side \(\times\) side

Area \(=9\) metres \(\times 9\) metres

Area \(=81\) square metres

\section*{Exercise Two}

Find the area of each shape. Be sure to include the units of measure in your answer. Check your work using the answer key at the end of the exercise.



\section*{Tile}
c.
d. A floor is 8 metres long and 4 metres wide. What is the area of the floor? (Hint: Draw a picture.)

\section*{Answers to Exercise Two}
a. 2 square metres
b. 3 square metres
c. 100 square centimetres
d. 32 square metres

\section*{Topic C: Self-Test}

\section*{Mark /8 Aim 7/8}
A. Solve each of the following word problems. (8 marks) Be sure to include the unit of measure in your answer. ( 2 marks each). Be sure to circle information and underline what is being asked.
a. Diego puts 6 apples into each bag. How many apples are there in 4 bags?
b. Alain wants to walk up 6 flights of stairs. There are 10 steps in each flight. How many steps will he have to walk up altogether?
c. In the metric system, 10 millimetres equals 1 centimetre. How many millimetres are there in 100 centimetres? (Hint: Multiply the number of centimeters by 10.)
d. Find the area of the picture.


\section*{Answers to Topic C Self-Test}
A.
a. 24 apples
b. 60 steps
c. 1000 millimetres
d. 15 square metres

\section*{Unit 4 Review: Multiplication}

You will now practice all the skills you learned in Unit 4. Check your work using the answer key at the end of the review
A. Find the products.
0
7
3
a. \(\times 7\)
g. \(\times 4\)
m. \(\times 6\)
b. \(\begin{array}{r}4 \\ \times 9\end{array}\)
8
h. \(\times 8\)
n. \(\times 8\)
3
c. \(\times 5\)
i. \(\times 6\)
o. \(\times 6\)
d. \(\begin{array}{r}2 \\ \times 3 \\ \hline\end{array}\)
6
j. \(\times 5\)
p. \(\times 8\)

3
5
e. \(\times 8\)
k. \(\times 9\)
6
f. \(\times 6\)
1. \(\times 9\)
B. Multiply across or horizontally.
a. \(7 \times 7=\)
b. \(9 \times 7=\)
c. \(2 \times 9=\)
d. \(4 \times 4=\)
e. \(3 \times 4=\)
f. \(5 \times 7=\)
g. \(8 \times 5=\)
h. \(6 \times 4=\)
C. Find the products.
a. \(10 \times 4=\)
b. \(7 \times 100=\)
c. \(100 \times 5=\)
d. \(1 \times 10=\)
e. \(1000 \times 8=\)
f. \(10 \times 9=\)
g. \(100 \times 8=\)
h. \(7 \times 1000=\)
i. \(1000 \times 2=\)
j. \(6 \times 10=\)
k. \(9 \times 100=\)
l. \(4 \times 1000=\)
D. Word Problems.
a. During a fishing derby, 8 people caught 7 fish each. How many fish were caught in all?
b. Manuel was told to make 10 rows of 6 cans each. How many cans were there in all?
c. For graduation, there were 10 rows of 100 chairs each. How many chairs were there altogether?
d. In the cafeteria, there are 9 tables with 8 chairs at each table. How many chairs are there in all?
e. Find the area of the rug. Remember to include the units of measure.

f. Find the area of the photograph.


\section*{Answers to Unit 4 Review}
A.
a. 0
a. 49
a. 40
a. 56 fish
b. 36
b. 63
b. 700
b. 60 cans
c. 15
c. 18
c. 500
c. 1000 chairs
d. 6
d. 16
d. 10
d. 72 chairs
e. 24
e. 12
e. 8000
e. 63 square metres
f. 36
f. 35
f. 90
f. 70 square centimetres
g. 28
g. 40
g. 800
h. 64
h. 24
h. 7000
i. 54
i. 2000
j. 30
j. 60
k. 45
k. 900
l. 81
l. 4000
m. 18
n. 32
o. 48
p. 56
B.
C.
D.

\section*{CONGRATULATIONS!!}

Now you have finished Unit 4.

\section*{TEST TIME!}

Ask your instructor for the Practice Test for this unit.
Once you've done the practice test, you need to do the unit 4 test.
Again, ask your instructor for this.
Good luck!

\section*{Unit 5: Making Change, Time \& Perimeter}

\section*{Topic A: Counting to Make Change}

Practice your counting by filling in the counting chart. Have your instructor check your chart when you are done.
\begin{tabular}{|l|l|l|l|l|l|l|l|l|l|}
\hline 0 & 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \\
\hline 10 & & & & & & & & & \\
\hline & & & & & & & & & \\
\hline & & & & & & & & & \\
\hline & & & & & & & & & \\
\hline & & & & & & & & & \\
\hline & & & & & & & & & \\
\hline
\end{tabular}

Use your counting chart and start at 0 . Count five and write down that number.
\begin{tabular}{|l|l|l|l|l|l|l|l|l|l|}
\hline 0 & 5 & 10 & & & & & & & \\
\hline & & & & & & & & & \\
\hline
\end{tabular}

If you had a pile of nickels or five dollar bills and wanted to know how much money you have, you would count by 5's.

Use your counting chart and starting at 0 . Count ten and write down that number.
\begin{tabular}{|l|l|l|l|l|l|l|l|l|l|}
\hline 0 & 10 & 20 & & & & & & & \\
\hline
\end{tabular}

If you had a pile of dimes or ten dollar bills and wanted to know how much money you have, you would count by 10's.

Use your counting chart and starting at 0 . Count twenty-five and write down that number.
\begin{tabular}{|l|l|l|l|l|}
\hline 0 & 25 & & & \\
\hline
\end{tabular}

If you had a pile of quarters and wanted to know how much money you have, you would count by 25 's.

\section*{Exercise One}

Write the missing numerals. Check your work using the answer key at the end of the exercise.
a. Count by 5's.
\begin{tabular}{|l|l|l|l|l|l|l|l|l|l|}
\hline 0 & & 10 & & 20 & 30 & & 40 & \\
\hline 50 & & 60 & & 70 & & 80 & & 90 & \\
\hline
\end{tabular}
b. Count by 5's.
\begin{tabular}{|l|l|l|l|l|l|l|l|l|l|}
\hline 0 & 5 & & 15 & & 25 & & 35 & & 45 \\
\hline & 55 & & 65 & & 75 & & 85 & & 95 \\
\hline
\end{tabular}
c. Count by 5's.
\begin{tabular}{|l|l|l|l|l|l|l|l|l|l|}
\hline \(\mathbf{0}\) & & & & & & & & & \\
\hline & & & & & & & & & \\
\hline
\end{tabular}
d. Count by 10 's.
\begin{tabular}{|l|l|l|l|l|l|l|l|l|l|}
\hline 0 & 10 & & 30 & 50 & & 70 & & 90 \\
\hline
\end{tabular}
e. Count by 10 's.
\begin{tabular}{|l|l|l|l|l|l|l|l|l|l|}
\hline 0 & & 20 & & 40 & & 60 & & 80 & \\
\hline
\end{tabular}
f. Count by 10 's.
\begin{tabular}{|l|l|l|l|l|l|l|l|l|l|}
\hline \(\mathbf{0}\) & & & & & & & & & \\
\hline
\end{tabular}
g. Count by 25 's.
\begin{tabular}{|l|l|l|l|l|}
\hline 0 & 25 & & 75 & \\
\hline
\end{tabular}
h. Count by 25 's.
\begin{tabular}{|l|l|l|l|l|}
\hline 0 & & 50 & & 100 \\
\hline
\end{tabular}
i. Count by 25 's.


\section*{Answers to Exercise One}
a.
\begin{tabular}{|l|l|l|l|l|l|l|l|l|l|}
\hline 0 & 5 & 10 & 15 & 20 & 25 & 30 & 35 & 40 & 45 \\
\hline 50 & 55 & 60 & 65 & 70 & 75 & 80 & 85 & 90 & 95 \\
\hline
\end{tabular}
b.
\begin{tabular}{|l|l|l|l|l|l|l|l|l|l|}
\hline 0 & 5 & 10 & 15 & 20 & 25 & 30 & 35 & 40 & 45 \\
\hline 50 & 55 & 60 & 65 & 70 & 75 & 80 & 85 & 90 & 95 \\
\hline
\end{tabular}
c.
\begin{tabular}{|l|l|l|l|l|l|l|l|l|l|}
\hline 0 & 5 & 10 & 15 & 20 & 25 & 30 & 35 & 40 & 45 \\
\hline 50 & 55 & 60 & 65 & 70 & 75 & 80 & 85 & 90 & 95 \\
\hline
\end{tabular}
d.
\begin{tabular}{|l|l|l|l|l|l|l|l|l|l|}
\hline 0 & 10 & 20 & 30 & 40 & 50 & 60 & 70 & 80 & 90 \\
\hline
\end{tabular}
e. \begin{tabular}{|l|l|l|l|l|l|l|l|l|l|}
\hline 0 & 10 & 20 & 30 & 40 & 50 & 60 & 70 & 80 & 90 \\
\hline
\end{tabular}
f. \begin{tabular}{|l|l|l|l|l|l|l|l|l|l|}
\hline 0 & 10 & 20 & 30 & 40 & 50 & 60 & 70 & 80 & 90 \\
\hline
\end{tabular}
g.
\begin{tabular}{|l|l|l|l|l|}
\hline 0 & 25 & 50 & 75 & 100 \\
\hline
\end{tabular}
h.

i.
\begin{tabular}{|l|l|l|l|l|}
\hline 0 & 25 & 50 & 75 & 100 \\
\hline
\end{tabular}

Note: There is no self-test for this topic.

\section*{Topic B: Making Change}

When you make change, your first goal is to get a number that ends in 0 or 5 . So for example, if you bought something for \(53 \Phi\), the first thing to do would be to get to \(55 ¢\). Check out example A below.

Example A: 53¢ to 55¢
To get from 53థ to 55\$, you would need 2 pennies.
Example B: 20\$ to 25\$
To get from \(20 \$\) to \(25 ¢\), you would 1 nickel.
Example C: 50¢ to 75¢
to get from \(50 ¢\) to \(75 ¢\), you would need 1 quarter.

\section*{Exercise One}

Circle the number of coins you would need to get from the first number to the second number. Make sure to use the least number of coins you can. Check your work using the answer key at the end of the exercise.
a. \(\$ 0.35\) to \(\$ 0.40\)

b. \(\$ 0.60\) to \(\$ 0.70\)

c. \(\$ 0.80\) to \(\$ 0.90\)

d. \(\$ 0.30\) to \(\$ 0.40\)

e. \(\$ 0.15\) to \(\$ 0.25\)

f. \(\$ 0.25\) to \(\$ 0.50\)

g. \(\$ 0.50\) to \(\$ 0.75\)


Answers to Exercise One
a. 1 nickel
b. 1 dime
c. 1 dime
d. 1 dime
e. 1 dime
f. 1 quarter
g. 1 quarter

\section*{Exercise Two}

State the number and kind of coins you would need to get from the first number to the second number. Make sure you use the least number of coins as possible. Check your work using the answer key at the end of the exercise.

Example \(\$ 0.56\) to \(\$ 0.60\)
4 pennies to get to \(\$ 0.60\)
a. \(35 ¢\) to \(45 ¢\)
b. 90 t to \(95 ¢\)
c. \(25 ¢\) to \(50 ¢\)
d. \(25 ¢\) to \(50 ¢\)
e. \(65 ¢\) to \(75 ¢\)
f. \(40 ¢\) to \(45 ¢\)
g. \(75 ¢\) to \(1.00 \$\)
h. \(5 \notin\) to \(15 ¢\)
i. \(55 ¢\) to \(65 ¢\)
j. 20 ¢ to \(25 ¢\)
k. 50 to \(75 ¢\)
l. 25 t to \(75 ¢\)
m. \(85 ¢\) to \(95 ¢\)
n. \(50 \$\) to \(\$ 1.00\)
o. 95 t to \(\$ 1.00\)
p. \(45 ¢\) to \(50 ¢\)

\section*{Answers to Exercise Two}
a. 1 dime
b. 1 nickel
c. 1 quarter
d. 1 quarter
e. 1 dime
f. 1 nickel
g. 1 quarter
h. 1 dime
i. 1 dime
j. 1 nickel
k. 1 quarter
l. 2 quarters
m. 1 dime
n. 2 quarters
o. 1 nickel
p. 1 nickel

\section*{Example D: 28¢ to 50¢}

You would need 2 pennies to get to \(30 ¢\). Then you would need 2 dimes to get to 50¢.

Example E: 36\$ to 50¢
You would need 4 pennies to get to 40 . Then you would need 1 dime to get to \(50 ¢\).
Example F: 60\$ to 75¢
You would need 1 nickel to get to \(65 \$\). Then you would need 1 dime to get to 75 .
OR
You could also begin with 1 dime to get to \(70 ¢\). Then you would need 1 nickel to get to 75 .

Exercise Three

State the number and kind of coins you would need to get change from \(\$ 1.00\). Make sure you use the least number of coins as possible. Check your work using the answer key at the end of the exercise.
a. 2 oranges cost \(70 ¢\)


2 quarters, 2 dimes
b. 2 pencils cost \(75 \$\)

c. 1 roll of toilet paper costs \(30 \Phi\)

d. a can of sardines costs \(80 \Phi\)
e. 1 lemon costs \(40 ¢\)

f. a bagel costs \(55 ¢\)

g. a roll of paper towels costs \(80 ¢\)

h. a jar of baby food costs \(75 ¢\)

i. a box of Kleenex costs \(80 \Phi\)

j. a bag of candy costs 70 ¢


\section*{Answers to Exercise Three}
b. 3 quarters
c. 1 quarter, 1 nickel
d. 3 quarters, 1 nickel
e. 1 quarters, 1 dime, 1 nickel
f. 2 quarters, 3 dimes
g. 3 quarters, 1 nickel
h. 3 quarters
i. 3 quarters, 1 nickel
j. 2 quarters, two dimes

\section*{Exercise Four}

State the number and kind of coins you would need to get change from \(\$ 1.00\). Make sure you use the least number of coins as possible. Check your work using the answer key at the end of the exercise.
a. Mrs. Bakshi bought two flower pots that cost \(85 \Phi\). What change will she get from \(\$ 1.00\) ?
b. Poloma bought a can of cat food for \(70 \Phi\). What change will she get from \(\$ 1.00\) ?
c. Two apples cost \(60 \Phi\). What change will you get from \(\$ 1.00\) ?
d. A pen costs 65\$. What change will you get from \(\$ 1.00\) ?

\section*{Answers to Exercise Four}
a. 2 pennies, 1 dime
b. 4 pennies, 1 quarter
c. 4 pennies, 2 dimes
d. 1 penny, 1 nickel, 1 quarter

\section*{Topic B: Self-Test}

\section*{Mark /21 Aim 17/21}
A. Circle the number of coins needed to get from the first number to the second number. Use the least number of coins. (4 marks)
a. \(75 ¢\) to \(80 ¢\)

b. \(20 ¢\) to \(25 ¢\)

c. \(40 ¢\) to \(50 ¢\)

d. \(50 ¢\) to \(75 ¢\)

B. State the number and kind of coin needed to get from the first number to the second number. (4 marks)
a. \(40 ¢\) to \(50 ¢\)
b. \(70 ¢\) to \(75 ¢\)
c. \(90 \$\) to \(\$ 1.00\)
d. \(25 ¢\) to \(50 \Phi\)
C. State the number and kind of coins you would need to get from the first number to the second number. Make sure you use the least number of coins as possible. (4 marks)
a. \(35 \not \subset\) to \(50 ¢\)
b. \(15 ¢\) to \(50 ¢\)
c. \(50 ¢\) to \(75 ¢\)
d. \(80 \$\) to \(\$ 1.00\)
D. State the number and kind of coins you would need to get change from \(\$ 1.00\). Make sure you use the least number of coins as possible. (9 marks)
a. \(20 ¢\)
e. a plastic beach shovel costs \(90 \$\)
b. \(40 \Phi\)
f. 2 plums cost \(60 \Phi\)
c. \(75 ¢\)
g. a head of lettuce cost 55\$
d. \(70 \Phi\)

\section*{Answers to Topic B Self-Test}
A.
a. 1 nickel
a. 1 dime
a. 1 nickel, 1 dime
a. 3 quarters, 1 nickel
b. 1 nickel
b. 1 nickel
b. 2 dimes, 1 quarter
b. 2 quarters, 1 dime
c. 1 dime
c. 1 dime
d. 1 quarter
B.
d. 1 quarter
C.
c. 1 quarter
d. 2 dimes
D.
c. 1 quarter
d. 1 nickel, 1 quarter
e. 1 dime
f. 1 quarter, 1 nickel, 1 dime
g. 2 dimes, 1 quarter

\section*{Topic C: Telling Time}

We have always been interested in keeping track of time. Sundials were the first way used to keep of track of time. The sundial had limits. It needed the sun and could not keep track of time at night. Through the centuries, many things have been used to keep track of time. In our modern society, we have used clocks. There are two types of clocks; digital and analog. Digital clocks display the time as numbers.

Analog clocks are clocks with hands. The shorter hand tells the hour and the longer hand tells the minutes. An easy way to remember the hour hand and the minutes hand is that hour is a shorter word than minute, and the shorter hand tells the hour.

In an analog clock, the minute hand travels faster than the hour hand as it has to cover 60 minutes. The hour hand only needs to travel between the numerals in the same time it takes the minute hand to cover 60 minutes.

To tell what time it is, look at the shorter hand to figure out what hour it is. Next, look at the minute hand to figure out the minutes. Each numeral of the clock represents a certain number of minutes. Look at the chart.
\begin{tabular}{|l|l|}
\hline Numeral & Minutes \\
\hline 1 & 5 \\
\hline 2 & 10 \\
\hline 3 & 15 \\
\hline 4 & 20 \\
\hline 5 & 25 \\
\hline 6 & 30 \\
\hline 7 & 35 \\
\hline 8 & 40 \\
\hline 9 & 45 \\
\hline 10 & 50 \\
\hline 11 & 55 \\
\hline 12 & o'clock \\
\hline
\end{tabular}

Write the time shown on each clock. Check your work using the answer key at the end of the exercise.
Example A:


The shorter hand is closer to the 7 . The longer hand is before the six. This means that the hour is 7 . The longer hand is pointing to the 5 . This means 25 minutes (check the chart on the page before). The time would be written as 7:25.

Example B:


Look at the shorter hand. If the longer hand is past the six, then the hour is the numeral before the one the shorter hand is pointing at. This means that the hour is 12 . The longer hand is pointing at the 10 . This means 50 minutes (check the chart on the page before). The time would be written as 12:50.
a.

b.

k.

m.
n.
1.


\section*{Answers to Exercise One}
a. 1:35
h. 2:50
b. 9:15
i. 1:20
c. \(4: 05\)
j. \(4: 45\)
d. 12:30
k. \(12: 25\)
e. \(8: 10\)
l. \(6: 10\)
f. 5:55
m. 8:50
g. 3:40
n. 9:40

\section*{Exercise Two}

Under each clock is a time on a digital clock. Put the hands on the analog clock to show the digital time. Check your work using the answer key at the end of the exercise.
a.

b.

c.

d.

e.

8: 30




\section*{24-hour Clock}

Your friend said she would meet you at 8:00 o'clock. Does that mean in the morning or the evening? We use a.m. and p.m. to know whether it is morning or evening.

Another way to avoid confusion is by using the 24 -hour clock. Airlines, military and health care are examples of places where the 24 -hour clock is used.

With the 12 -hour clock, each of the hours is repeated is a day. In the 24 -hour clock, each hour in a day is counted giving us 24 hours. In the 24 -hour clock, 12:00 a.m. can be written as 0000 or 2400.0000 is the start of a new day, while 2400 is the end of the day.

We write times with 4 digits. The first two digits are the hours and the next two digits are the minutes.
\begin{tabular}{|l|l|l|l|}
\hline 12-hour clock & 24-hour clock & 12-hour clock & 24-hour clock \\
\hline 12:00 a.m. & 0000 or 2400 & 12:00 p.m. & 1200 \\
\hline 1:00 a.m. & 0100 & 1:00 p.m. & 1300 \\
\hline 2:00 a.m. & 0200 & 2:00 p.m. & 1400 \\
\hline 3:00 a.m. & 0300 & 3:00 p.m. & 1500 \\
\hline 4:00 a.m. & 0400 & \(4: 00\) p.m. & 1600 \\
\hline 5:00 a.m. & 0500 & 5:00 p.m. & 1700 \\
\hline 6:00 a.m. & 0600 & 6:00 p.m. & 1800 \\
\hline 7:00 a.m. & 0700 & 7:00 p.m. & 1900 \\
\hline 8:00 a.m. & 0800 & 8:00 p.m. & 2000 \\
\hline 9:00 a.m. & 0900 & 9:00 p.m. & 2100 \\
\hline 10:00 a.m. & 1000 & \(10: 00\) p.m. & 2200 \\
\hline 11:00 a.m. & 1100 & \(11: 00\) p.m. & 2300 \\
\hline
\end{tabular}

For example, 8:20 a.m. would be 0820, while 8:20 p.m. would be 2020 .
To convert 12-hour clock to 24 -hour clock, add 12 to the hour for any times after 1:00 p.m. to 11:59 p.m.

Example: 6:30 p.m.
\(6: 30+12: 00=1830\)
Example: 10:30 p.m.
\(10: 30+12: 00=2230\)
When writing times in 24-hour clock, we do not use a colon.

Change each 12-hour clock time to 24 -hour clock time. Watch carefully for a.m. and p.m. Remember: only times between 12:00 p.m. and 11:59 p.m. need to be changed. Check your work using the answer key at the end of the exercise.
a. 6:30 a.m.
g. 5:30 a.m.
b. \(10: 45\) p.m.
h. 11:50 p.m.
c. \(8: 10\) p.m.
i. \(1: 55 \mathrm{p} . \mathrm{m}\).
d. 4:15 a.m.
j. 2:05 a.m.
e. 7:35 p.m.
k. 3:20 p.m.
f. 9:40 a.m.
l. 12:25 a.m.

\section*{Answers to Exercise Three}
a. 0630
b. 2245
c. 2010
d. 0415
e. 1935
f. 0940
g. 0530
h. 2350
i. 1355
j. 0205
k. 1520
l. 0025

\section*{Exercise Four}

Change each 24 -hour clock time to 12 -hour clock time. Watch carefully for a.m. and p.m. Check your work using the answer key at the end of the exercise.
a. 1204
b. 0822
c. 1842
d. 0425
e. 1440
f. 0910
g. 1735
h. 1605
i. 0342
j. 2305
k. 0550
l. 1330

\section*{Answers to Exercise Four}
a. 12:04 p.m.
b. 8:22 a.m.
c. 6:42 p.m.
h. \(4: 05\) p.m.
d. 4:25 a.m.
i. 3:42 a.m.
e. 2:40 p.m.
j. 11:05 p.m.
f. 9:10 a.m.
k. 5:50 a.m.
g. 5:35 p.m.
l. 1:30 p.m.

\section*{Exercise Five}

Below are the ferry schedules from West Vancouver (Horseshoe Bay) to Nanaimo (Departure Bay) and Vancouver (Tsawwassen) to Nanaimo (Duke Point).. Change each 12- hour clock time to 24-hour clock time. Check your work using the answer key at the end of the exercise.
\begin{tabular}{|l|l|l|l|}
\hline \begin{tabular}{l} 
Leave West Vancouver (Horseshoe \\
Bay), Departs
\end{tabular} & \begin{tabular}{l} 
24-hour clock \\
time
\end{tabular} & \begin{tabular}{l} 
Leave Vancouver (Tsawwassen), \\
Departs
\end{tabular} & \begin{tabular}{l} 
24-hour clock \\
time
\end{tabular} \\
\hline 6:30 a.m. & & \(5: 15\) a.m. & \\
\hline 8:30 a.m. & & \(7: 45\) a.m. & \\
\hline 10:30 a.m. & & \(10: 15\) a.m. & \\
\hline 12:30 p.m. & \(12: 45\) p.m. & \\
\hline 3:00 p.m. & \(3: 15\) p.m. & \\
\hline 5:00 p.m. & 5:45 p.m. & \\
\hline 7:00 p.m. & 8:15 p.m. & \\
\hline 9:00 p.m. & \(10: 45\) p.m. & \\
\hline
\end{tabular}

\section*{Answers to Exercise Six}
\begin{tabular}{|l|l|l|l|}
\hline \begin{tabular}{l} 
Leave West Vancouver (Horseshoe \\
Bay), Departs
\end{tabular} & \begin{tabular}{l} 
24-hour clock \\
time
\end{tabular} & \begin{tabular}{l} 
Leave Vancouver (Tsawwassen), \\
Departs
\end{tabular} & \begin{tabular}{l} 
24-hour clock \\
time
\end{tabular} \\
\hline 6:30 a.m. & 0630 & \(5: 15\) a.m. & 0515 \\
\hline 8:30 a.m. & 0830 & \(7: 45\) a.m. & 0745 \\
\hline 10:30 a.m. & 1030 & \(10: 15\) a.m. & 1015 \\
\hline 12:30 p.m. & 1230 & \(12: 45\) p.m. & 1245 \\
\hline 3:00 p.m. & 1500 & \(3: 15\) p.m. & 1515 \\
\hline 5:00 p.m. & 1700 & \(5: 45\) p.m. & 1745 \\
\hline 7:00 p.m. & 1900 & \(8: 15\) p.m. & 2015 \\
\hline 9:00 p.m. & 2100 & \(10: 45\) p.m. & 2245 \\
\hline
\end{tabular}

\section*{Topic C: Self-Test}

\section*{Mark /22 Aim 17/22}
A. Write the time shown on each clock. (6 marks)
a.

c.


d.

e.

f.

B. Under each clock is a time on a digital clock. Put the hands on the analog clock to show the digital time. (4 marks)

C. Change each 12 -hour clock time to 24 -hour clock time. Watch carefully for a.m. and p.m. (6 marks)
a. 6:25 a.m.
d. 10:40 a.m.
b. 11:05 p.m.
e. 4:00 p.m.
c. 2:55 p.m.
f. 8:15 a.m.
D. Change each 24-hour clock time to 12 -hour clock time. Watch carefully for a.m. and p.m. (6 marks)
a. 0155
b. 0020
c. 1935
d. 0545
e. 1530
f. 2110

\section*{Answers to Topic C Self-Test}
A.
a. \(12: 35\)
d. \(10: 53\)
b. \(4: 15\)
e. 7:22
c. 2:10
f. 9:44
a.

c.

B.

d.

C.
a. 0625
d. 1040
b. 2305
e. 1600
c. 1455
f. 0815
D.
a. 1:55 a.m.
d. 5:45 a.m.
b. 12:20 a.m.
e. 3:30 p.m.
c. 7:35 p.m.
f. 9:10 p.m.

\section*{Topic D: Adding Units of Time}

Sometimes we need to add units of time to find out how much in total it will take to do some job or to travel to some other place.

To add units of time, do this:
Place the numbers to be added in columns - minutes with minutes, hours with hours, seconds with seconds

Add each column. Be sure to write the unit of time.
```

Example A

```
\[
\begin{array}{r}
12 \mathrm{~h}, 45 \mathrm{~min} \\
+\quad 10 \mathrm{~h}, 05 \mathrm{~min} \\
\hline
\end{array}
\]

Step 1: Add the minutes to the minutes
\[
\begin{array}{r}
45 \mathrm{~min} \\
+\quad 05 \mathrm{~min} \\
\hline 50 \mathrm{~min}
\end{array}
\]

Step 2: Add the hours to the hours
\(12 \mathrm{~h}+10 \mathrm{~h}=22 \mathrm{~h}\)
\(12 \mathrm{~h}, 45 \mathrm{~min}\)
The sum of \(\frac{+10 \mathrm{~h}, 05 \mathrm{~min}}{22 \mathrm{~h}, 50 \mathrm{~min}}\)
\[
\begin{array}{r}
4 \mathrm{~h}, 50 \mathrm{~min}, 15 \mathrm{~s} \\
+\quad 21 \mathrm{~h}, 05 \mathrm{~min}, 40 \mathrm{~s}
\end{array}
\]

Step 1: Add the seconds to the seconds.
\(15 \mathrm{~s}+40 \mathrm{~s}=55 \mathrm{~s}\)
Step 2: Add the minutes to the minutes.
\[
\begin{array}{r}
50 \mathrm{~min} \\
+\quad 05 \mathrm{~min} \\
\hline 55 \mathrm{~min}
\end{array}
\]

Step 3: Add the hours to the hours.
\(4 h+21 h=25 h\)
\[
4 \mathrm{~h}, 50 \mathrm{~min}, 15 \mathrm{~s}
\]

The sum of \(+21 \mathrm{~h}, 05 \mathrm{~min}, 40 \mathrm{~s}\)
\[
24 \mathrm{~h}, 55 \mathrm{~min}, 55 \mathrm{~s}
\]

\section*{Exercise One}

Add the times. Check your work using the answer key at the end of the exercise.
\(3 \mathrm{~h}, 20 \mathrm{~min}\)
\(9 \mathrm{~h}, 50 \mathrm{~min}\)
a. \(+5 \mathrm{~h}, 15 \mathrm{~min}\)
c. \(+14 \mathrm{~h}, 05 \mathrm{~min}\)
\(11 \mathrm{~h}, 05 \mathrm{~min}\)
b. \(+\quad 4 \mathrm{~h}, 40 \mathrm{~min}\)
\(2 \mathrm{~h}, 10 \mathrm{~min}\)
d. \(+6 \mathrm{~h}, 25 \mathrm{~min}\)
\(7 \mathrm{~h}, 35 \mathrm{~min}\)
e. \(+1 \mathrm{~h}, 10 \mathrm{~min}\)

\section*{\(10 \mathrm{~h}, 30 \mathrm{~min}\) \\ f. \(+8 \mathrm{~h}, 20 \mathrm{~min}\)}
\(\begin{array}{r}1 \mathrm{~h}, 55 \mathrm{~min}, 15 \mathrm{~s} \\ \text { g. }+\quad 28 \mathrm{~h}, 0 \mathrm{~min}, 40 \mathrm{~s} \\ \hline\end{array}\)
\(4 \mathrm{~h}, 45 \mathrm{~min}, 05 \mathrm{~s}\)
h. \(+\quad 15 \mathrm{~h}, 10 \mathrm{~min}, 50 \mathrm{~s}\)
\(7 \mathrm{~h}, 35 \mathrm{~min}, 20 \mathrm{~s}\)
i. \(+6 \mathrm{~h}, 15 \mathrm{~min}, 30 \mathrm{~s}\)
\[
\begin{array}{r}
3 \mathrm{~h}, 25 \mathrm{~min}, 45 \mathrm{~s} \\
\mathrm{j} . \\
+\quad 8 \mathrm{~h}, 30 \mathrm{~min}, 10 \mathrm{~s} \\
\hline
\end{array}
\]
\(3 \mathrm{~h}, 45 \mathrm{~min}, 15 \mathrm{~s}\)
k. \(+12 \mathrm{~h}, 05 \mathrm{~min}, 35 \mathrm{~s}\)
\(4 \mathrm{~h}, 50 \mathrm{~min}, 30 \mathrm{~s}\)
1. \(+5 \mathrm{~h}, 0 \mathrm{~min}, 25 \mathrm{~s}\)

\section*{Answers to Exercise One}
a. \(8 \mathrm{~h}, 35 \mathrm{~min}\)
b. \(15 \mathrm{~h}, 45 \mathrm{~min}\)
c. \(23 \mathrm{~h}, 55 \mathrm{~min}\)
d. \(8 \mathrm{~h}, 35 \mathrm{~min}\)
e. \(19 \mathrm{~h}, 45 \mathrm{~min}\)
f. \(18 \mathrm{~h}, 50 \mathrm{~min}\)
g. \(29 \mathrm{~h}, 55 \mathrm{~min}, 55 \mathrm{~s}\)
h. \(19 \mathrm{~h}, 55 \mathrm{~min}, 55 \mathrm{~s}\)
i. \(13 \mathrm{~h}, 50 \mathrm{~min}, 50 \mathrm{~s}\)
j. \(11 \mathrm{~h}, 55 \mathrm{~min}, 55 \mathrm{~s}\)
k. \(15 \mathrm{~h}, 50 \mathrm{~min}, 50 \mathrm{~s}\)
l. \(9 \mathrm{~h}, 50 \mathrm{~min}, 55 \mathrm{~s}\)

\section*{Exercise Two}

Rewrite each question in columns. Be careful to write seconds under seconds, minutes under minutes and hours under hours. Check your work using the answer key at the end of the exercise.
a. Fabio worked \(8 \mathrm{~h}, 48 \mathrm{~min}\) on his homework. The following week, he worked \(9 \mathrm{~h}, 10 \mathrm{~min}\) on his homework. How much time in total did he work on his homework?
b. Day one of the holiday trip took \(11 \mathrm{~h}, 32 \mathrm{~min}\). Day two took \(10 \mathrm{~h}, 26 \mathrm{~min}\). How much time did we travel in two days?

\section*{Answers to Exercise Two}
a. \(17 \mathrm{~h}, 58 \mathrm{mins}\)
b. \(21 \mathrm{~h}, 58 \mathrm{mins}\)

\section*{Subtracting Units of Time}

We need to subtract units of time to find out how much time it took to do some job or to travel to some other place.

To subtract units of time, do this:
Place the numbers to be subtracted in columns - minutes with minutes, hours with hours, seconds with seconds

Subtract each column. Be sure to write the unit of time.

\section*{Example C}
\[
\begin{array}{r}
2 \mathrm{~h}, 45 \mathrm{~min} \\
-\quad 1 \mathrm{~h}, 05 \mathrm{~min} \\
\hline
\end{array}
\]

Step 1: Subtract the minutes from the minutes.
\(45 \mathrm{~min}-05 \mathrm{~min}=40 \mathrm{~min}\)
Step 2: Subtract the hours from the hours.
\(2 \mathrm{~h}-1 \mathrm{~h}=1 \mathrm{~h}\)
\(2 \mathrm{~h}, 45 \mathrm{~min}\)
The difference of \(\frac{-\quad 1 \mathrm{~h}, 05 \mathrm{~min}}{1 \mathrm{~h}, 40 \mathrm{~min}}\)
\[
\begin{array}{r}
5 \mathrm{~h}, 45 \mathrm{~min}, 10 \mathrm{~s} \\
-\quad 2 \mathrm{~h}, 35 \mathrm{~min}, 05 \mathrm{~s} \\
\hline
\end{array}
\]

Step 1: Subtract the seconds from the seconds.
\(10 \mathrm{~s}-05 \mathrm{~s}=05 \mathrm{~s}\)
Step 2: Subtract the minutes from the minutes
\(45 \mathrm{~min}-35 \mathrm{~min}=10 \mathrm{~min}\)
Step 3: Subtract the hours from the hours
\(5 h-2 h=3 h\)
\(5 \mathrm{~h}, 45 \mathrm{~min}, 10 \mathrm{~s}\)
The sum of \(-2 \mathrm{~h}, 35 \mathrm{~min}, 05 \mathrm{~s}\)
\(3 \mathrm{~h}, 10 \mathrm{~min}, 05 \mathrm{~s}\)

\section*{Exercise Three}
\(12 \mathrm{~h}, 55 \mathrm{~min}\)
a. \(\quad-\quad 3 \mathrm{~h}, 5 \mathrm{~min}\)
d. \(\quad-\quad 4 \mathrm{~h}, 15 \mathrm{~min}\)
\(9 \mathrm{~h}, 45 \mathrm{~min}\)
b. \(\quad-\quad 6 \mathrm{~h}, 10 \mathrm{~min}\)
e. \(-5 \mathrm{~h}, 05 \mathrm{~min}\)
\(\begin{array}{r}24 \mathrm{~h}, 50 \mathrm{~min} \\ \text { c. } \quad-\quad 8 \mathrm{~h}, 35 \mathrm{~min} \\ \hline\end{array}\)
\(12 \mathrm{~h}, 20 \mathrm{~min}\)
f. \(\quad-\quad 10 \mathrm{~h}, 05 \mathrm{~min}\)
\(16 \mathrm{~h}, 45 \mathrm{~min}, 55 \mathrm{~s}\)
g. \(\quad-\quad 9 \mathrm{~h}, 25 \mathrm{~min}, 15 \mathrm{~s}\)
\(17 \mathrm{~h}, 50 \mathrm{~min}, 35 \mathrm{~s}\)
h. \(\quad-\quad 8 \mathrm{~h}, 15 \mathrm{~min}, 20 \mathrm{~s}\)
\(13 \mathrm{~h}, 55 \mathrm{~min}, 40 \mathrm{~s}\)
i. \(\quad-\quad 5 \mathrm{~h}, 30 \mathrm{~min}, 10 \mathrm{~s}\)
\[
\begin{array}{r}
15 \mathrm{~h}, 40 \mathrm{~min}, 50 \mathrm{~s} \\
\text { j. } \quad-\quad 6 \mathrm{~h}, 20 \mathrm{~min}, 25 \mathrm{~s} \\
\hline
\end{array}
\]
\(14 \mathrm{~h}, 50 \mathrm{~min}, 40 \mathrm{~s}\)
k. \(\quad-\quad 7 \mathrm{~h}, 35 \mathrm{~min}, 05 \mathrm{~s}\)
\(28 \mathrm{~h}, 50 \mathrm{~min}, 30 \mathrm{~s}\)
1. \(\quad-\quad 9 \mathrm{~h}, 35 \mathrm{~min}, 0 \mathrm{~s}\)
g. \(7 \mathrm{~h}, 20 \mathrm{~min}, 40 \mathrm{~s}\)
h. \(9 \mathrm{~h}, 35 \mathrm{~min}, 15 \mathrm{~s}\)
i. \(8 \mathrm{~h}, 25 \mathrm{~min}, 30 \mathrm{~s}\)
j. \(9 \mathrm{~h}, 20 \mathrm{~min}, 25 \mathrm{~s}\)
k. \(7 \mathrm{~h}, 15 \mathrm{~min}, 35 \mathrm{~s}\)
l. \(19 \mathrm{~h}, 15 \mathrm{~min}, 30 \mathrm{~s}\)

\section*{Exercise Four}

Rewrite each question in columns. Be careful to write seconds under seconds, minutes under minutes and hours under hours. Check your work using the answer key at the end of the exercise.
a. Milan works \(45 \mathrm{~h}, 30\) min each week. He has worked \(32 \mathrm{~h}, 15 \mathrm{~min}\) this week. How much more time can he work?
b. The trip from Vancouver to Calgary takes \(17 \mathrm{~h}, 40 \mathrm{~min}\) on the bus. The trip from Vancouver to Kamloops takes \(5 \mathrm{~h}, 05 \mathrm{~min}\). How much longer must you travel to get to Calgary?
c. The flight from Vancouver to Toronto leaves at \(12 \mathrm{~h}, 30 \mathrm{~min}\). The flight arrives in Toronto at 15 h , 53 min . How long is the flight from Vancouver to Toronto?
d. Over two months, Lola has used her cell phone for \(43 \mathrm{~h}, 37 \mathrm{~min}, 58 \mathrm{~s}\). In June, she used her cell phone for \(21 \mathrm{~h}, 22 \mathrm{~min}, 25 \mathrm{~s}\). How much time has she used her cell phone this month?

\section*{Answers to Exercise Four}
a. \(13 \mathrm{~h}, 15 \mathrm{~min}\)
b. \(12 \mathrm{~h}, 35 \mathrm{~min}\)
c. \(3 \mathrm{~h}, 23 \mathrm{~min}\)
d. \(22 \mathrm{~h}, 15 \mathrm{~min}, 33 \mathrm{~s}\)
e. \(2 h, 10 \mathrm{~min}, 01 \mathrm{~s}\)

\section*{Topic D: Self-Test}

\section*{Mark /24 Aim 19/24}
A. Find the sums. (4 marks)
\(12 \mathrm{~h}, 15 \mathrm{~min}\)
a. \(+4 \mathrm{~h}, 35 \mathrm{~min}\)
c. \(+2 \mathrm{~h}, 10 \mathrm{~min}\)
\(7 \mathrm{~h}, 50 \mathrm{~min}\)
b. \(+10 \mathrm{~h}, 05 \mathrm{~min}\)
\(1 \mathrm{~h}, 25 \mathrm{~min}\)
d. \(+15 \mathrm{~h}, 20 \mathrm{~min}\)
B. Find the sums. (4 marks)
\(9 \mathrm{~h}, 42 \mathrm{~min}\)
a. \(\quad+\quad 3 \mathrm{~h}, 16 \mathrm{~min}\)
c. \(\quad+3 \mathrm{~h}, 21 \mathrm{~min}\)
b. \(\begin{array}{r}5 \mathrm{~h}, 53 \mathrm{~min} \\ +\quad 8 \mathrm{~h}, 02 \mathrm{~min} \\ \hline\end{array}\)
\(22 \mathrm{~h}, 33 \mathrm{~min}\)
d. \(+14 \mathrm{~h}, 16 \mathrm{~min}\)
C. Rewrite each question in columns and find the sums. (4 marks)
a. Ingrid walked the dogs for \(3 \mathrm{~h}, 15 \mathrm{~min}\) on Monday. On Tuesday, she walked the dogs for \(2 \mathrm{~h}, 40 \mathrm{~min}\). Find the total time that Ingrid walked the dogs.
b. Bianca rode the bus to college for \(2 \mathrm{~h}, 36 \mathrm{~min}\) on Wednesday. On Thursdays, the same trip took \(3 \mathrm{~h}, 21 \mathrm{~min}\). How long was she on the bus altogether?
D. Find the differences. (4 marks)
\(12 \mathrm{~h}, 55 \mathrm{~min}\)
\(11 \mathrm{~h}, 50 \mathrm{~min}\)
a. \(\quad-\quad 4 \mathrm{~h}, 35 \mathrm{~min}\)
c. \(\quad-\quad 7 \mathrm{~h}, 15 \mathrm{~min}\)
\(9 \mathrm{~h}, 45 \mathrm{~min}\)
\(40 \mathrm{~h}, 40 \mathrm{~min}\)
b. \(\quad-\quad 3 \mathrm{~h}, 30 \mathrm{~min}\)
d. \(\quad-\quad 15 \mathrm{~h}, 05 \mathrm{~min}\)
E. Find the differences. 4 marks
\(8 \mathrm{~h}, 58 \mathrm{~min}\)
a. \(\quad-\quad 6 \mathrm{~h}, 34 \mathrm{~min}\)
\(14 \mathrm{~h}, 47 \mathrm{~min}\)
\(18 \mathrm{~h}, 41 \mathrm{~min}\)
b. \(\quad-\quad 5 \mathrm{~h}, 29 \mathrm{~min}\)
d. \(\quad-\quad 9 \mathrm{~h}, 26 \mathrm{~min}\)
F. Rewrite each question in columns and find the sums. (4 marks)
a. During rush hour, it took Marco \(2 \mathrm{~h}, 51 \mathrm{~min}\) to drive home. During non-rush hour, it took Marco \(1 \mathrm{~h}, 48 \mathrm{~min}\) to drive home. Find the difference.
b. Kade and Amia left from the Kelowna at the same time. Kade took 5 h, 37 min to drive home. Amia took 4 h, 29 min to drive home. Find the difference.

\section*{Answers to Topic D Self-Test}
A.
a. \(16 \mathrm{~h}, 50 \mathrm{~min}\)
a. \(12 \mathrm{~h}, 58 \mathrm{~min}\)
a. \(5 \mathrm{~h}, 55 \mathrm{~min}\)
a. \(8 \mathrm{~h}, 20 \mathrm{~min}\)
a. \(2 \mathrm{~h}, 24 \mathrm{~min}\)
a. \(1 \mathrm{~h}, 03 \mathrm{~min}\)
b. \(17 \mathrm{~h}, 55 \mathrm{~min}\)
b. \(13 \mathrm{~h}, 55 \mathrm{~min}\)
b. \(5 \mathrm{~h}, 57 \mathrm{~min}\)
b. \(6 \mathrm{~h}, 15 \mathrm{~min}\)
b. \(9 \mathrm{~h}, 18 \mathrm{~min}\)
b. \(1 \mathrm{~h}, 08 \mathrm{~min}\)
c. \(13 \mathrm{~h}, 50 \mathrm{~min}\)
c. \(9 \mathrm{~h}, 59 \mathrm{~min}\)
d. \(16 \mathrm{~h}, 45 \mathrm{~min}\)
B.
d. \(36 \mathrm{~h}, 49 \mathrm{~min}\)
C.
D.
c. \(4 \mathrm{~h}, 35 \mathrm{~min}\)
c. \(9 \mathrm{~h}, 18 \mathrm{~min}\)
d. \(25 \mathrm{~h}, 35 \mathrm{~min}\)
E.
d. \(9 \mathrm{~h}, 15 \mathrm{~min}\)
F.

\section*{Topic E: Perimeter}

Perimeter is from the Greek language. Peri means "around". Perimeter is the distance around something. If you walked around the outside of your building, you would have walked close to the perimeter of the building. (The actual perimeter would be the outside wall which is a little tricky to walk on!) A fence around a field is at the perimeter of the field. In this sense, we are using perimeter to mean "the outside edge". The length of the entire fence is the measure of the perimeter.

\section*{Example A}

Picture yourself going for a walk, starting at the door of your building.


Your walk was in the shape of an octagon. How far did you walk? When you add together all the distances, you get 1200 m .
You have just found the perimeter of an octagon.

\section*{Example B}

The new memorial park was built in an interesting shape. The park is a hexagon. A walking path goes around the perimeter of the park.

How long is the path?


Add the measure of each side of the park. The perimeter of this hexagon is 960 m .

To find the perimeter of a polygon, add the lengths of all the sides together.

\section*{Exercise One}

Find the perimeter of each figure. Be sure to include the units of measure in your answer. Check your work using the answer key at the end of the exercise.


d.

\section*{Answers to Exercise One}
a. 235 metres
b. 480 metres
c. 36 kilometres
d. 30 kilometres
e. 3400 kilometres

\section*{Finding the Perimeter of a Square}

Write the definition of a square.
By definition then, a square has four sides that are all congruent (have the same measure). To find the perimeter you can add the four sides.


Perimeter \(=8 \mathrm{~cm}+8 \mathrm{~cm}+8 \mathrm{~cm}+8 \mathrm{~cm}=32 \mathrm{~cm}\)

Exercise Two

Find the perimeter of the squares described in each question. The measure of one side has been given. Be sure
to include the units of measure in your answer. Check your work using the answer key at the end of the exercise.
a. \(s=75 \mathrm{~m}\)
\(p=75 m+75 m+75 m+75 m\)
\(\mathrm{p}=\)
b. \(\mathrm{s}=12 \mathrm{~m}\)
\(\mathrm{p}=\)
c. \(\mathrm{s}=100 \mathrm{~km}\)
\(\mathrm{p}=\)
d. \(\mathrm{s}=50 \mathrm{~cm}\)
\(\mathrm{p}=\)
e. \(s=130 \mathrm{~m}\)
\(\mathrm{p}=\)
f. \(\mathrm{s}=1000 \mathrm{~km}\)
\(\mathrm{p}=\)
g. \(\mathrm{s}=165 \mathrm{~m}\)
p \(=\)
h. \(\mathrm{s}=325 \mathrm{~m}\)
p \(=\)
i. \(\mathrm{s}=68 \mathrm{~cm}\)
\(\mathrm{p}=\)
j. \(s=85 \mathrm{~mm}\)
p \(=\)

\section*{Answers to Exercise Two}
a. 300 metres
b. 48 millimetres
c. 400 kilometres
d. 200 centimetres
e. 520 metres
f. 4000 kilometres
g. 660 metres
h. 1300 metres
i. 272 centimetres
j. 340 millimetres

\section*{Problems using the Perimeters of Squares}

\section*{Example C}

Ted needs to build a fence around his swimming pool. The swimming pool with its deck is a square shape that measures 35 m per side. How much fencing must Ted buy?
Step 1: Question.
How much fencing must Ted buy?
Step 2: Find the needed information-drawing a sketch is often helpful.

- fence around a square pool \(\mathrm{s}=35 \mathrm{~m}\)

Step 3: Operations.
The fence is a perimeter, so find the perimeter of a square.
\(P=35 m+35 m+35 m+35 m\)
\(P=140 \mathrm{~m}\) of fence Ted must buy 140 m of fencing.

\section*{Exercise Three}

Solve these problems using perimeters of squares. The problems may need two operations. Be sure to include the units of measure in your answer. Check your work using the answer key at the end of the exercise.
a. The campground security officer walks around the outside of the campground four times every evening. The campground is 800 m square. How far does the officer walk in these patrols each night? Note: 800 m square is a common way of saying "a square with sides that measure 800 m. ."
b. Lee is going to install base boards in the recreation room he has built in his basement. The room is five metres square. The baseboard material is expensive, so he will be sure to deduct 1 m for each of the two doorways. How much baseboard material does he need to buy?
c. Phil is going to fence his large 50 m square vegetable garden to keep the deer out. The fence will be made with four strands of barbed wire. How much barbed wire should Phil buy? The fence will look like this:


\section*{Answers to Exercise Three}
a. 12800 metres
b. 18 metres
c. 800 metres

\section*{Finding the Perimeter of a Rectangle}

Write the definition of a rectangle.
```

Example D

```

length \((\mathrm{l})=12 \mathrm{~m}\)
width ( w ) \(=3 \mathrm{~m}\)
To find the perimeter you can find the sum of \(12 m+3 m+12 m+3 m=30 m\)

\section*{Example E}

Find the perimeter of a rectangle 25 m long and 15 m wide.

\(P=15 m+25 m+15 m+25 m=80 m\)

\section*{Exercise Four}

Find the perimeter of the rectangles described below. Draw and label a sketch for each. Be sure to include the units of measure in your answer. Check your work using the answer key at the end of the exercise.
a. \(\mathrm{L}=10 \mathrm{~cm}\)
\(\mathrm{w}=70 \mathrm{~km}\)
\(\mathrm{w}=6 \mathrm{~cm}\)
p \(=\)
p \(=\)
b. \(\mathrm{L}=100 \mathrm{~km}\)
c. \(L=15 \mathrm{~mm}\)
\(\mathrm{w}=10 \mathrm{~mm}\)
\(p=\)
d. \(L=97 \mathrm{~cm}\)
\(\mathrm{w}=35 \mathrm{~cm}\)
p \(=\)
e. \(\mathrm{L}=400 \mathrm{~km}\)
\(\mathrm{w}=100 \mathrm{~km}\)
p \(=\)
f. \(L=42 m\)
\(\mathrm{w}=67 \mathrm{~m}\)
p \(=\)
g. \(L=132 m\)
\(\mathrm{w}=76 \mathrm{~m}\)
p \(=\)
h. \(L=196 \mathrm{~cm}\)
\(\mathrm{w}=28 \mathrm{~cm}\)
p \(=\)

\section*{Answers to Exercise Four}
a. 32 centimetres
b. 340 kilometres
c. 50 millimetres
d. 64 centimetres
e. 1000 kilometres
f. 218 metres
g. 416 metres
h. 488 centimetres

\section*{Problems using Perimeters of Rectangles}

\section*{Exercise Five}

Solve these problems. Draw and label a sketch for each. Be sure to include the units of measure in your answer. Check your work using the answer key at the end of the exercise.
a. Janice plans to sew lace on the edge of a tablecloth that is 132 cm in width and 218 cm long. How much lace does she need?
b. One physical education teacher starts each class by having everyone jog around the school 4 times. The school is rectangular (shaped like a rectangle) and 160 m long and 95 m wide. About how far do the students jog each class? Note: 160 m long and 95 m wide may be written as " 160 m by 95 m".
c. How many metres of baseboard are needed for a rectangular room 4 m by 3 m ? Deduct 1 m for each of the two doorways.
d. Dennis likes to cycle 30 km daily around a cycle path at a local park. The park is rectangular and measures 3 km in width and 5 km in length. How far does Dennis cycle if he rides around the park twice?
e. Calculate the total amount of weather-stripping needed to go around these windows in a house.
- 3 windows each measuring 76 cm by 122 cm
- 2 windows each measuring 152 cm by 135 cm
f. The Nuoris are going to replace the fascia board (the trim at the edge of a roof) with new pressure-treated cedar board. Their flat roof is 14 m by 12 m . How much fascia board is needed?

\section*{Answers to Exercise Five}
a. 700 centimetres
b. 2040 metres
c. 12 metres
d. 32 kilometres
e. 2336 centimetres
f. 52 metres

\section*{Topic E: Self-Test}

\section*{Mark /6 Aim 5/6}
A. Find the perimeter of each shape. (4 marks)
a.

30 km

c.
43 cm
d.

b.
B. Word Problems. Draw and label a sketch for each. Be sure to include the units of measure in your answer. (2 mark)
a. How much chrome edging will Juanita need for a kitchen table 121 cm square?
b. Than is going to frame a fabulous poster that is 100 cm by 70 cm . How much framing material should he buy?

\section*{Answers to Topic E Self-Test}
A.
a. 42 centimetres
b. 172 centimetres
c. 84 kilometres
d. 29 metres
B.
a. 484 centimetres
b. 340 centimetres

\section*{Unit 5 Review: Making Change and Time}

You will now practice all the skills you learned in Unit 5. Check your work using the answer key at the end of the review.
A. Circle the number of coins you would need to get from the first number to the second number. Make sure to use the least number of coins you can.
a. \(35 ¢\) to \(40 ¢\)

b. \(85 ¢\) to \(90 ¢\)

c. \(60 ¢\) to \(70 ¢\)

d. \(25 ¢\) to \(50 ¢\)

B. State the number and kind of coins you would need to get from the first number to the second number. Make sure you use the least number of coins as possible.
a. \(95 \$\) to \(\$ 1.00\)
b. \(15 ¢\) to \(25 ¢\)
c. \(75 \$\) to \(\$ 1.00\)
C. State the number and kind of coins you would need to get from the first number to the second number. Make sure you use the least number of coins as possible.
a. \(65 \$\) to \(75 \$\)
b. \(35 ¢\) to \(75 ¢\)
c. \(20 ¢\) to \(50 ¢\)
D. State the number and kind of coins you would need to get change from \(\$ 1.00\). Make sure you use the least number of coins as possible.
a. \(40 ¢\)
b. \(55 ¢\)
c. \(20 ¢\)
d. \(80 ¢\)
e. \(35 ¢\)
f. \(65 ¢\)
g. 2 apples cost \(75 \$\)
h. a pen costs \(95 ¢\)
E. Write the time shown on each clock.
i. a doughnut costs \(75 ¢\)
j. a ruler costs \(25 ¢\)
k. Mrs. Low bought 3 lemons for 904. How much change will she get back from \(\$ 1.00\) ?
l. Mr. Garcia bought a can of peaches for 654. How much change will he get back from \(\$ 1.00\) ?

F. Under each clock is a time on a digital clock. Put the hands on the analog clock to show the digital time.

G. Change each 12-hour clock time to 24 -hour clock time. Watch carefully for a.m. and p.m. Remember: only times between 1:00 p.m. and 11:59 p.m. need to be changed.
a. 6:48 a.m.
d. 5:30 a.m.
b. 9:56 p.m.
e. 11:17 p.m.
c. 7:45 p.m.
f. 10:08 a.m.
H. Change each 24-hour clock time to 12-hour clock time. You will need to use a.m. or p.m in your answer.
a. 2115
b. 0718
c. 1326
d. 1142
e. 1830
f. 0145
I. Add the times.
\(6 \mathrm{~h}, 40 \mathrm{~min}\)
a. \(+3 \mathrm{~h}, 10 \mathrm{~min}\)
\(4 \mathrm{~h}, 20 \mathrm{mins}\)
b. \(+\quad 8 \mathrm{~h}, 15 \mathrm{~min}\)
\(8 \mathrm{~h}, 42 \mathrm{~min}\)
c. \(+6 \mathrm{~h}, 15 \mathrm{~min}\)
\(7 \mathrm{~h}, 36 \mathrm{~min}\)
d. \(+9 \mathrm{~h}, 22 \mathrm{~min}\)
\(4 \mathrm{~h}, 15 \mathrm{~min}\)
e. \(+7 \mathrm{~h}, 29 \mathrm{~min}\)
\[
\begin{array}{r}
5 \mathrm{~h}, 36 \mathrm{~min} \\
\text { f. } \quad+\quad 9 \mathrm{~h}, 17 \mathrm{~min} \\
\hline
\end{array}
\]
\(2 \mathrm{~h}, 43 \mathrm{~min}, 35 \mathrm{~s}\)
g. \(\quad+\quad 5 \mathrm{~h}, 11 \mathrm{~min}, 22 \mathrm{~s}\)
\(6 \mathrm{~h}, 24 \mathrm{~min}, 43 \mathrm{~s}\)
h. \(\quad+\quad 9 \mathrm{~h}, 28 \mathrm{~min}, 08 \mathrm{~s}\)
i. The first soccer game took \(2 \mathrm{~h}, 32 \mathrm{~min}\) to complete. The second soccer game took \(3 \mathrm{~h}, 19\) min. How long did both games take?
j. The first cross-country skier completed the race in \(2 \mathrm{~h}, 05 \mathrm{~min}, 37 \mathrm{~s}\). The second skier completed the race in \(2 \mathrm{~h}, 06 \mathrm{~min}\), 18 s . What is the total time?
J. Subtract the times.
\(6 \mathrm{~h}, 45 \mathrm{~min}\)
a. \(\begin{array}{r}-\quad 3 \mathrm{~h}, 20 \mathrm{~min} \\ \hline \\ \text { b. } \quad-\quad 4 \mathrm{~h}, 50 \mathrm{~min}, 15 \mathrm{~min} \\ \hline\end{array}\)
\(16 \mathrm{~h}, 58 \mathrm{~min}\)
c. \(\quad-\quad 7 \mathrm{~h}, 27 \mathrm{~min}\)
\(11 \mathrm{~h}, 47 \mathrm{~min}\)
d. \(\quad-\quad 2 \mathrm{~h}, 13 \mathrm{~min}\)
\(17 \mathrm{~h}, 42 \mathrm{~min}\)
e. \(\quad-\quad 9 \mathrm{~h}, 18 \mathrm{~min}\)
\(13 \mathrm{~h}, 51 \mathrm{~min}\)
f. \(\quad-\quad 8 \mathrm{~h}, 37 \mathrm{~min}\)
\(14 \mathrm{~h}, 32 \mathrm{~min}, 41 \mathrm{~s}\)
g. \(\quad-\quad 5 \mathrm{~h}, 26 \mathrm{~min}, 39 \mathrm{~s}\)
\(18 \mathrm{~h}, 47 \mathrm{~min}, 36 \mathrm{~s}\)
h. \(\quad-\quad 9 \mathrm{~h}, 19 \mathrm{~min}, 19 \mathrm{~s}\)
i. The first cross country skier to finished the race in \(1 \mathrm{~h}, 34 \mathrm{~min}, 04 \mathrm{~s}\). The next
cross country skier finished the race in 1 London to Paris on the train. It takes \(\mathrm{h}, 42 \mathrm{~min}, 33 \mathrm{~s}\). What is the difference \(8 \mathrm{~h}, 55 \mathrm{~min}\) to travel from London to in their times?
j. It takes \(2 \mathrm{~h}, 20 \mathrm{~min}\) to travel from

Paris by both ferry and train. How much longer does it take by ferry and train?
K. Find the perimeter of the shape. Be sure to put the unit of measure in your answer.

L. Find the perimeter of each square. Be sure to include the unit of measure in your answer.
a.

\section*{6 kilometres}

.

b.
c. Chung is putting new fencing around his square swimming pool. The length of side is 30 metres. How much fencing will Chung need?
M. Find the perimeter of each rectangle. Be sure to include the unit of measure in your answer.

5 metres


12 metres
a.

\section*{24 centimetres}

b.
c. Say Han is decorating a rectangular birthday that measures 61 centimetres by 31 centimetres. He wants to put an icing decoration around the cake. What is the perimeter of the cake?

\section*{Answers to Unit 5 Review}
A.
a. 1 nickel
c. 1 dime
b. 1 dime, 1 nickel
d. 1 quarter
B.
a. 1 nickel
b. 1 dime
c. 1 quarter
C.
a. 1 dime
b. 1 quarter, 1 dime
c. 1 nickel, 1 quarter
D.
a. 1 dime, 2 quarters
b. 2 dimes, 1 quarter
nickel
j. 3 quarters
c. 1 dime, 3 quarters
f. 1 dime, 1 quarter
k. 1 dime
d. 2 dimes
g. 1 quarter
e. 1 dime, 2 quarters,
h. 1 dime
a. \(11: 30\)
1i. 1 dime
E.
d. \(10: 25\)
g. 9:12
b. \(4: 55\)
e. 7:13
h. 11:37
c. \(3: 45\)
f. \(12: 48\)
a.

IIT: II
c.

F.

G.
a. 0648
b. 2156
c. 1945
d. 0530
e. 2317
f. 1008
H.
a. 9:15 p.m.
c. \(1: 26\) p.m.
e. 6:30 p.m.
b. 7:18 a.m.
d. 11:42 a.m.
f. 1:45 a.m.
I.
a. \(9 \mathrm{~h}, 50 \mathrm{~min}\)
b. \(12 \mathrm{~h}, 35 \mathrm{~min}\)
c. \(14 \mathrm{~h}, 57 \mathrm{~min}\)
d. \(16 \mathrm{~h}, 58 \mathrm{~min}\)
e. \(11 \mathrm{~h}, 44 \mathrm{~min}\)
f. \(14 \mathrm{~h}, 53 \mathrm{~min}\)
g. \(7 \mathrm{~h}, 54 \mathrm{~min}, 57 \mathrm{~s}\)
h. \(15 \mathrm{~h}, 52 \mathrm{~min}, 51 \mathrm{~s}\)
i. \(5 \mathrm{~h}, 51 \mathrm{~min}\)
j. \(4 \mathrm{~h}, 11 \mathrm{~min}, 55 \mathrm{~s}\)
J.
a. \(3 \mathrm{~h}, 25 \mathrm{~min}\)
e. \(8 \mathrm{~h}, 24 \mathrm{~min}\)
i. \(8 \mathrm{~min}, 29 \mathrm{~s}\)
b. \(4 \mathrm{~h}, 35 \mathrm{~min}\)
f. \(5 \mathrm{~h}, 14 \mathrm{~min}\)
j. \(6 \mathrm{~h}, 35 \mathrm{~min}\)
c. \(9 \mathrm{~h}, 31 \mathrm{~min}\)
g. \(9 \mathrm{~h}, 06 \mathrm{~min}, 02 \mathrm{~s}\)
d. \(9 \mathrm{~h}, 34 \mathrm{~min}\)
h. \(9 \mathrm{~h}, 28 \mathrm{~min}, 17 \mathrm{~s}\)
K.
a. 31 metres
b. 22 metres
c. 30 metres
L.
a. 24 kilometres
b. 52 centimetres
c. 120 metres
M.
a. 34 metres
b. 84 centimetres
c. 184 centimetres

\section*{CONGRATULATIONS!!}

Now you have finished Unit 5.
TEST TIME!
Ask your instructor for the Practice Test for this unit.
Once you've done the practice test, you need to do the unit 5 test.
Again, ask your instructor for this.
Good luck!

\section*{Book 2 Review}

You will now practice all the skills you learned in Book 2. Check your work using the answer key at the end of the review.

If you can't remember how to do a question, go back to the lesson on this topic to refresh your memory. The unit and topic for where each question came from is listed next to the question.

Example: 1-B means Unit 1, Topic B

\section*{1-A}
A. Write the place value names (ones, tens, hundreds, thousands, ten thousands, hundred thousands, millions) for each underlined digit.
a. \(1 \underline{2} 30\) - what is the place value of 2 ? 6 ?
b. \(2 \underline{3} 4965\) - what is the place value of 3 ? d. \(6219 \underline{8}\) - what is the place value of 8 ?
c. \(\underline{6} 245903\) - what is the place value of
B. Using the number 452781 039, write the digit that is in each of the following place values.
a. tens
c. hundred thousands
b. ten thousands
d. millions
C. Underline the digit for the place value named.
a. thousands 182374
c. hundred thousands 3142650
b. hundreds 1051
d. thousands 21087
D. Write the word names for the numbers.
a. 63374
b. 7248
E. Write numerals for these word names.
a. three million, two hundred fourteen thousand, five hundred sixty-seven
b. fifty-one thousand, two hundred two

\section*{1-B}
F. Write each number in expanded form.
a. 3479
b. 21016
G. Write each number from expanded form.
a. \(4000000+100000+10000+3000+200+40+8=\)
b. \(100000+80000+2000+300+4=\)

\section*{1-C}
H. Arrange these numbers in order from smallest to largest.
a. \(\begin{array}{lllllll}312 & 23 & 2154 & 2514 & 633 & 43 & 5412\end{array}\)
b. \(45 \quad 554 \quad 544 \quad 5454 \quad 5544 \quad 55 \quad 454 \quad 445\)
I. Write \(<,>\) or \(=\) in each blank as needed.
a. 76125 \(\qquad\) 71625
c. \(14527 \ldots 14752\)
b. 4325 \(\qquad\) 3425
d. 65234 \(\qquad\) 65234

1-D
J. Round each number to the nearest 100 .
a. 672
b. 3473
K. Round each number to the nearest 1000.
a. 41370
b. 64921
L. Round each number to the nearest 10000 .
a. 76125
b. 582412
M. Round each number to the nearest 100000 .
a. 351257
b. 8675247
N. Round each number to the nearest 1000000 .
a. 7351257
b. 4165268
O. Word Problems.
a. The Bering Sea is 1547 metres deep. The Caribbean Sea is 2647 metres deep. The Indian Ocean is 3963 metres deep. The Pacific Ocean is 4028 metres deep. Round each number to the nearest 100 .
\begin{tabular}{|l|l|l|}
\hline Sea & Number & Rounded Number \\
\hline Bering Sea & & \\
\hline Caribbean Sea & & \\
\hline Indian Ocean & & \\
\hline Pacific Ocean & & \\
\hline
\end{tabular}
b. The Yellow Sea has an area of 293960 square metres. The Red Sea has an area of 452990 square metres. The Black Sea has an area of 507900 square metres. Round each number to the nearest 100000.
\begin{tabular}{|l|l|l|}
\hline Sea & Number & Rounded Number \\
\hline Yellow Sea & & \\
\hline Red Sea & & \\
\hline Black Sea & & \\
\hline
\end{tabular}

2-A
P. Find the sums
53
21
a. +24
d.
45
\begin{tabular}{r}
\(+\quad 32\) \\
\hline
\end{tabular}
60
b. +19
41
e.33
\(+\quad 24\)24
74
c. +22
Q. Find the sums

300 Liz Girard
362
4723
d. +4165
a.
114
\(+\quad 523\)
425
b. \(\begin{array}{r}241 \\ +\quad 312 \\ \hline\end{array}\)
421
c.
\[
\begin{array}{r} 
\\
+\quad 332 \\
\hline
\end{array}
\]
R. Find the sums.
65
a. +423
238
b. +5421
43
543
c.
\(\begin{array}{r}+\quad 124 \\ \hline\end{array}\)
S. Find the sums.
47
a. +87
87
b. +59
26
72
c. +98
e.
\(+\quad 19\)
T. Find the sums.
148
a. +996
592
d.
327
\(\begin{array}{r}9168 \\ \text { b. } \quad+\quad 5878 \\ \hline\end{array}\)
78945
93165
e. \(\begin{array}{r}1684 \\ +\quad 3719\end{array}\)
5534
c. +93165
b. \(+\quad 5878\)

f.
\begin{tabular}{l}
\(+\quad 87\) \\
\hline
\end{tabular}
U. Find the sums.
a. \(85+29+77=\)
b. \(692+7834+8096=\)
c. \(43124+9517=\)
d. \(358726+81297+3216=\)

2-C
V. Estimate the sums.
582
690
\(+\quad 163\)
a.
81904
c.
54061
\(+\quad 15243\)
1637
b. \(\begin{array}{r}6835 \\ +\quad 3175 \\ \hline\end{array}\)
\(\qquad\)
d.
42563
.
\(+\quad 6429\)
W. Word Problems. Estimate the following answer. Be sure to round to the largest place value before adding.
a. Indonesia has 7606 square kilometres of coral reef. Australia has 7299 square kilometres of coral reef. The Philippines has 3736 square kilometres of coral reef. Estimate how much coral reef there is in these three countries.

\section*{3-B}
X. Find the differences.
76
9758
a. -35
e. \(\quad-\quad 9421\)
98
b. \(\quad-\quad 27\)

863
48296
c. \(\quad-\quad 410\)

1294
d. \(\quad-\quad 681\)
\begin{tabular}{r}
145789 \\
i. \(\quad-\quad 61425\) \\
\hline
\end{tabular}
Y. Rewrite each question in columns then find the differences.
a. \(569-421=\)
b. \(7854-1304=\)
c. \(15939-6714=\)
d. \(86579-23104=\)
e. \(157849-86531=\)
f. \(136975-72041=\)

3-D
Z. Find the Differences.
22
981
a. -4
d. \(\quad-\quad 52\)
43
894
b. -15
e. \(-\quad 265\)
782
943
c. \(\quad-\quad 43\)
f. \(\quad-\quad 492\)

AA. Find the differences. Check your answers using addition.
91
1751
a. -28 Check:
c. \(\quad 835\) Check:
532
76487
b. -240 Check:
d. \(\quad-\quad 5179\) Check:

AB. Find the differences.
468
8323
d. -4798
a. -79
752
b. \(\quad-\quad 479\)
e. -3748
9364
62435
c. \(\quad-\quad 580\)
f. \(\quad-\quad 17689\)

AC. Find the differences.
420
a. -68
d. -1765
900
b. -325
e. -7143

3403
53610
c. \(\quad 849\)
f. -46929

AD. Rewrite each question in columns then find the difference.
a. \(973-178=\)
b. \(5129-479=\)
c. \(3730-2896=\)
d. \(91220-78357=\)

3-E

AE. Estimate the differences.
872
a. -465
6324
b. \(\quad-\quad 389\)

AF. Estimate the following answers. Be sure to round to the largest place value possible before adding or subtracting. Remember to circle the information and underline what is being asked. Check your work using the answer key at the end of the exercise.
a. When Mrs. Wu traded in her old car, it had 72468 kilometres on the odometer. The new used car she bought had 8975 kilometres on the odometer. Estimate the difference in kilometres between her old car and her new car.
b. Mario's restaurant served 53058 meals last year. This year to date, the restaurant has served 5837 meals. Estimate how many more meals Mario's restaurant served last year.

\section*{3-F}

AG. Word Problems. Use the 5 problem solving steps. Look for key words and patterns to help you choose the correct operation. Estimate the answer using rounded numbers if the numbers have 2 digits or more.
a. The WAC Bennett Dam near Revelstoke is 2068 metres long. The Keenleyside Dam near Castlegar is 853 metres long. The Mica Dam near Revelstoke is 241 metres long. What is the total length of the three dams?
b. Raoul earned \(\$ 35668\) last year. This year he has earned \(\$ 42791\). How much more did Raoul earn this year?
c. During one month, Jasmine spends 12645 minutes sleeping and 5723 minutes eating. How much time does she spend sleeping and eating?

AH. Find the sum or difference for each question.
a. \(273+538-54=\)
b. \(2875-496+162=\)
c. \(2998+579-673=\)
d. \(4723+5806-3924=\)
e. Abigail earned \(\$ 383\) and \(\$ 622\) from her two jobs. She decided to keep \(\$ 265\) for her Christmas shopping and put the rest of the money in the bank. Estimate how much money Abigail put in the bank

AI. Circle the number of coins you would need to get from the first number to the second number. Make sure to use the least number of coins you can.
a. \(70 ¢\) to \(75 ¢\)

b. \(80 \$\) to \(\$ 1.00\)

c. \(50 ¢\) to \(75 ¢\)


\section*{4-B}

AJ. State the number and kind of coins you would need to get from the first number to the second number. Make sure you use the least number of coins as possible.
a. \(25 ¢\) to \(50 ¢\)
b. \(70 ¢\) to \(75 ¢\)
c. 20 to \(75 ¢\)

AK. State the number and kind of coins you would need to get change from \(\$ 1.00\). Make sure you use the least number of coins as possible. Check your work using the answer key at the end of the exercise.
a. \(40 ¢\)
b. \(50 ¢\)
c. \(70 \Phi\)
d. a litre of pop for \(95 ¢\)
e. an apple pastry for \(60 ¢\)

4-C

AL. Write the time shown on each clock.


AM. Under each clock is a time on a digital clock. Put the hands on the analog clock to show the
digital time.


AN. Change each 12 -hour clock time to 24 -hour clock time. Watch carefully for a.m. and p.m. Remember: only times between 1:00 p.m. and 11:59 p.m. need to be changed.
a. 7:32 a.m.
c. 2:43 p.m.
b. 11:06 p.m.
d. 10:18 a.m.

AO. Change each 12 -hour clock time to 24 -hour clock time. Watch carefully for a.m. and p.m. Remember: only times between 1:00 p.m. and 11:59 p.m. need to be changed.
a. 0127
b. 1548
c. 0612
d. 2053

4-D

AP. Add the times.
\(5 \mathrm{~h}, 32 \mathrm{~min}\)
a. \(+4 \mathrm{~h}, 21 \mathrm{~min}\)
\(3 \mathrm{~h}, 27 \mathrm{~min}\)
b. \(\quad+\quad 2 \mathrm{~h}, 19 \mathrm{~min}\)
\(7 \mathrm{~h}, 41 \mathrm{~min}, 23 \mathrm{~s}\)
c. \(+\quad 9 \mathrm{~h}, 07 \mathrm{~min}, 24 \mathrm{~s}\)

AQ. subtract the times.
\(5 \mathrm{~h}, 53 \mathrm{~min}\)
a. \(\quad-\quad 3 \mathrm{~h}, 12 \mathrm{~min}\)
d. \(\quad-\quad 9 \mathrm{~h}, 19 \mathrm{~min}, 28 \mathrm{~s}\)
\(9 \mathrm{~h}, 47 \mathrm{~min}\)
b. \(\quad-\quad 4 \mathrm{~h}, 29 \mathrm{~min}\)
e. Elan had 4 h , 31 min to do her errands. She took \(2 \mathrm{~h}, 28 \mathrm{~min}\) to have her hair done. How much does Elan have left to finish her errands?
\(15 \mathrm{~h}, 59 \mathrm{~min}, 39 \mathrm{~s}\)
c. \(\quad-\quad 7 \mathrm{~h}, 38 \mathrm{~min}, 14 \mathrm{~s}\)

4-E

AR. Find the perimeter of the shape. Be sure to put the unit of measure in your answer.
41 centimetres

a.

\section*{55 millimetres}

c.
d. Kono is going to put tape around a rectangular table. He has 2500 cm of tape. The table measures 60 centimetres wide and 70 centimetres long. how much tape will he use?
e. Charla wants to put a ribbon around the edge of a square whose side measures 112 cm . How much ribbon does she need?

\section*{Answers to Book 2 Review}
A.
a. hundreds
c. millions
b. ten thousands
d. ones
B.
a. 3
b. 8
c. 7
d. 2
C.
a. \(18 \underline{2} 374\)
b. \(1 \underline{0} 51\)
c. \(3 \underline{1} 42650\)
d. 21087
D.
a. sixty-three thousand, three hundredb. seven thousand, two hundred forty-eight seventy-four
E.
a. 3214567
b. 51202
F.
a. \(3000+400+70+9\)
b. \(20000+1000+10+6\)
G.
a. 4133248
b. 182304
H.
a. \(23,43,312,633,2154,2514,5412\)
b. \(45,55,445,454,544,554,5454,5544\)
I.
a. >
c. <
b. >
d. =
J.
a. 700
b. 3500
K.
a. 41000
b. 65000
L.
a. 80000
b. 580000
M.
a. 400000
b. 8700000
N.
a. 7000000
b. 4000000
O.
a.
\begin{tabular}{|l|l|l|}
\hline Sea & Number & Rounded Number \\
\hline Bering Sea & 1547 & 1500 \\
\hline Caribbean Sea & 2647 & 2600 \\
\hline Indian Ocean & 3963 & 4000 \\
\hline Pacific Ocean & 4028 & 4000 \\
\hline
\end{tabular}
b.
\begin{tabular}{|l|l|l|}
\hline Sea & Number & Rounded Number \\
\hline Yellow Sea & 293960 & 300000 \\
\hline Red Sea & 452990 & 500000 \\
\hline Black Sea & 507900 & 500000 \\
\hline
\end{tabular}
P.
a. 77
b. 79
c. 96
d. 98
e. 98
f. 109
Q.
a. 999
b. 978
c. 899
d. 8888
e. 10664
f. 12936
R.
a. 488
b. 5659
c. 899
d. 15559
e. 105769
f. 69888
S.
a. 134
b. 146
c. 124
d. 193
e. 145
f. 132373
T.
a. 1114
b. 15046
c. 172100
d. 1187
e. 10937
f. 132373
U.
a. 191
b. 16622
c. 52641
d. 443239
V.
a. \(600+700+200=1500\)
b. \(2000+7000+3000=12000\)
c. \(80000+50000+20000=150000\)
d. \(43000+4000+6000=53000\)
W.
a. \(8000+7000+4000=19000\) square kilometres
X.
a. 41
b. 71
c. 453
d. 613
e. 337
f. 7584
g. 23162
h. 32602
i. 84364
Y.
a. 148
b. 6550
c. 9225
d. 63475
e. 71318
f. 64934
Z.
a. 18
b. 28
c. 739
d. 929
e. 629
f. 451

AA.
a. \(63,63+28=91\)
b. \(292,292+240=532\)
c. \(916,916+835=1751\)
d. \(71208,71308+5179=76487\)

AB.
a. 389
b. 273
c. 8784
d. 3525
e. 48979
f. 44746

AC.
a. 352
b. 575
c. 2554
d. 2149
e. 38867
f. 6681

AD.
a. 795
b. 4650
c. 834
d. 12863

AE.
a. \(900-500=400\)
b. \(6300-400=5900\)
c. \(57000-9000=48000\)
d. \(65000-7000=58000\)

AF.
a. \(70000-9000=61000\) kilometres
b. \(50000-6000=4000\) meals

AG.
a. 3162 metres
b. \(\$ 7123\)

AH.
a. 657
b. 2541
c. 2904
d. 6605
e. \(\$ 740\)

AI.
a. 2 pennies
b. 1 nickel
c. 2 dimes
d. 1 quarter

AJ.
a. 1 quarter
c. 1 nickel, 2 quarters
b. 1 nickel

AK.
a. 1 dime, 2 quarters
b. 2 quarters
c. 1 nickel, 1 quarter
d. 1 dime
e. 1 nickel, 1 dime, 1 quarter

AL.
a. 7:15
d. 10:03
b. 3:40
e. \(4: 36\)
c. \(11: 20\)
f. 9:57

c.

a.

b.
12:05
d.


e.
a. 0732
b. 2306
a. 1:27 p.m.
b. 3:48 p.m.
d. 8:53 p.m.

AP.
a. \(9 \mathrm{~h}, 53 \mathrm{~min}\)
c. \(16 \mathrm{~h}, 48 \mathrm{~min}, 47 \mathrm{~s}\)
b. \(5 \mathrm{~h}, 46 \mathrm{~min}\)
d. \(14 \mathrm{~h}, 43 \mathrm{~min}, 25 \mathrm{~s}\)

AQ.
a. \(2 \mathrm{~h}, 41 \mathrm{~min}\)
c. \(8 \mathrm{~h}, 21 \mathrm{~min}, 25 \mathrm{~s}\)
b. \(5 \mathrm{~h}, 18 \mathrm{~min}\)
d. \(9 \mathrm{~h}, 15 \mathrm{~min}, 14 \mathrm{~s}\)

AR.
a. 332 centimetres
d. 260 centimetres
b. 46 metres
e. 448 centimetres
c. 220 millimetres
f.
c. 1443
d. 1018

AO.
c. 6:12 a.m.
. 220 mill


CONGRATULATIONS!!
Now you have finished Book 2.
TEST TIME!
Ask your instructor for the Practice Test for this book.
Once you've done the practice test, you need to do the end test.
Again, ask your instructor for this.
Good luck!

\section*{Acknowledgments-1st Edition}

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\section*{Versioning History}

This page provides a record of edits and changes made to this book since its initial publication. Whenever edits or updates are made in the text, we provide a record and description of those changes here. If the change is minor, the version number increases by 0.01 . If the edits involve substantial updates, the version number increases to the next full number.

The files posted by this book always reflect the most recent version. If you find an error in this book, please fill out the Report an Error (https://collection.bccampus.ca/report-error/) form.
\begin{tabular}{|c|c|c|c|}
\hline Version & Date & Change & Details \\
\hline 1.00 & \[
\begin{aligned}
& \text { October 3, } \\
& 2014
\end{aligned}
\] & Book initially published in the BC Open Collection. & \\
\hline 2.00 & \[
\begin{aligned}
& \text { November 1, } \\
& 2022
\end{aligned}
\] & Book updated and republished in Pressbooks as the second edition. & \\
\hline 2.01 & \[
\begin{aligned}
& \text { January 25, } \\
& 2023
\end{aligned}
\] & Minor edits for consistency of ALF Math series. & \begin{tabular}{l}
- Created a "How to Deal with Math Anxiety" front matter section, which is now standardized across all ALF Math books. \\
- Deleted "Topic A: Emotions and Learning" since that content is now covered in the "How to Deal with Math Anxiety" front matter. \\
- Re-lettered the remaining topics in Unit 1.
\end{tabular} \\
\hline
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