MATH

GRADE **6**

COMPLETE GRADE 6 MATH CURRICULUM

ON
EDITION

IN THE BOOK:

- ✓ 100% alignment with provincial curriculum
- ✓ Clear and concise instructions
- ✓ Questions ranging from easy to expert

Enhance Your Learning:
www.dynamicmath.ca

DYNAMIC MATH

DYNAMIC DC CLASSROOM

Dear Parents,

Helping kids understand and apply mathematics knowledge and skills is a collective responsibility of parents, teachers, and principals.

Students need to learn mathematics in a way that will serve them throughout their lives. Understanding mathematics can provide our students with many job and career opportunities.

This is why students need to know why mathematics works the way it does, how to use it with confidence and competence when solving problems.

Understanding mathematics enables us to:

- Solve problems, make sound decisions and perform calculations with ease
- Explain how we solved a problem and why we made a particular decision
- Understand patterns and trends so that we can make predictions
- Understand Financial Literacy to manage time and money
- Handle everyday situations that involve numbers and feel confident

Before your child can learn mathematics, he or she needs to believe in his or her ability to do so. That's where you come in!

Parents, you are your child's first role model for learning. When you engage with your child in a supportive, relaxed atmosphere, your child will enjoy exploring the world of mathematics.

Dynamic Math is committed to helping parents and students. We understand that not everyone learns the same way, and not everyone feels the same about math. This is why we are continually working to create math resources that help students of all abilities, while supporting the many learning styles and varying levels of enthusiasm towards math.

From our clear concise instructions and straightforward guided examples to our additional practice material and tests, there's something to suit everyone. Combined with our video tutorials, students will be able to get a tutor-like experience from anywhere and at a fraction of the cost of standard tutoring or after-school help programs.

DYNAMIC MATH

ONTARIO GRADE 6 MATH

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To ensure we are bringing the best product to market, Dynamic Math recruited some Ontario Math teachers/instructors currently teaching math in various school districts across the province. Here are some of their comments after completing their reviews.

Elyse L, B.Ed, B.A. – Teacher - York Catholic District School Board

"The Dynamic Math books cover the contents of the Ontario Curriculum in a clear and concise manner. The straightforward examples provide ample opportunities for learning through differentiated methods. The books definitely help to consolidate learning".

"Dynamic math not only covers the updated Ontario curriculum but also provides ample opportunities for student practice and growth."

Melissa A. Manzo - Professor and Coordinator - George Brown College

"The coding chapter in this workbook does an excellent job explaining the material and making connections to everyday life, as required by the new Ontario curriculum".

Natalie, Teacher - York Catholic District School Board

"Dynamic Math has proven to provide a comprehensive overview of all curriculum expectations and big ideas required for a student to be successful in the intermediate grades across Ontario."

"I believe that the resources will provide elementary school teachers a concrete means to supplement lesson planning. Dynamic Math offers a wide variety of meaningful mathematical applications, an abundance of practice problems, and fantastic coding tutorials and exercises."

Keli J, Teacher - Pickering College

The Dynamic Math books are detailed and provide step by step instructions. Each chapter has a myriad of examples and a great variety of questions, incorporating all the aspects of the new curriculum. The books are very accessible for students due to the clear and concise layout and flow of each unit.

Colin Garnham – Professor of Mathematics – George Brown College

As a teacher in a math upgrading program, all students would benefit from the clear and concise resources developed by Dynamic Math. Using these resources, my adult student's numeracy skills would be superior, math would come more easily to them and they would once again love math!

Ontario Math Curriculum

Old vs New Comparison

Content and Structure

In the 2005 curriculum, students found it difficult to connect learning from year to year. There are different expectations for English-language and French-language learners.	In the 2020 curriculum, there will be clear connections to show how math skills build from year to year. There will be one curriculum in both English and French – the same learning experience for all Ontario students.

Real-life Connections

In the 2005 curriculum, there are outdated examples for students.	In the 2020 curriculum, there will be relevant, real-life examples that help connect math to everyday life, such as developing infographics, creating a budget, e-transfers and learning to code.

Number Facts

In the 2005 curriculum, students are not required to memorize key number facts.	In the 2020 curriculum, there will be more focus on fundamental math concepts, such as learning multiplication facts of 0×0 to 12×12, to enhance problem solving and mental math.

Spatial Sense

In the 2005 curriculum, younger grades have limited learning about spatial reasoning, for example making connections between measurement and geometry.	In the 2020 curriculum, there will be use of spatial relationships and shapes to help young children prepare to learn later math. Across all grades, students will understand basic number concepts, patterning and geometric concepts.

Fractions

In the 2005 curriculum, fraction concepts are confusing in early grades.	In the 2020 curriculum, there will be concepts about equal sharing to make fractions easier to understand, starting in Grade 1.

Mathematics confidence

In the 2005 curriculum, building mathematics confidence is implied.	In the 2020 curriculum, there will be tools and strategies that are part of the curriculum to help students develop confidence, cope with challenges and think critically.

Coding

In the 2005 curriculum, there are no explicit references to coding.	In the 2020 curriculum, starting in Grade 1, there will be coding skills to improve problem solving and develop fluency with technology.

Financial Literacy

In the 2005 curriculum, financial literacy concepts are limited to basic understanding of money and coins.	In the 2020 curriculum, there will be mandatory financial literacy learning in Grades 1 to 8, including understanding the value and use of money over time, how to manage financial well-being and the value of budgeting.

Table of Contents
Ontario Grade 6 Mathematics

INTRODUCTION

In Grade 6 mathematics, students continue to build on what they have already learned and are introduced to several new concepts. While working through the different topics, it is important that the students work on their **Social and Emotional Learning**, using applications and activities from each content area.

<u>CONTENT</u>

The mathematical content in Grade 6 builds on what was learned in Grade 5. Previous content is covered in greater depth with wider applications. New topics are added in some areas.

Number Concepts

Students work with numbers up to 1 000 000. In number sense, they work with factors and multiples, as well as improper fractions and mixed numbers. The number system is expanded to include integers with negative numbers.

Number Operations

This topic includes addition, subtraction, multiplication, and division with whole numbers, fractions, and decimals. Concepts of ratio, rate, and percent are included. The order of operations is also introduced at this grade level.

Financial Literacy

In this chapter**,** money transactions, financial goals, and percent applications, including discounts, are introduced. There is a focus on how these concepts are applied in everyday life.

Variables, Equations, and Inequalities

Work in this area includes applications of patterns in tables and charts. Variables, equations, and inequalities are introduced, and a problem-solving approach is used.

Measurement

This chapter includes perimeter, area, measuring angles, triangles, and capacity.

Geometric and Spatial Sense

Students will work with triangles, polygons, 3-dimensional solids, and transformations of shapes in this chapter.

Data and Probability

The chapter provides an introduction to samples and populations, and includes ways of displaying and interpreting data. It includes applications of probability in business and everyday life through the use of experimental and theoretical probability.

The section covering each content area begins with a description of the concept, followed by examples with clear step-by-step solutions. Students are then provided with questions that range from easy to difficult. Each chapter contains a set of extra practice questions on key concepts from each section in the chapter. Each chapter ends with a chapter test. Answers to all exercises and chapter tests are provided.

SOCIAL EMOTIONAL LEARNING

Social emotional skills (SES) are important when working with mathematics. Using these skills help you to think about how to solve problems. These skills are enhanced by developing problem-solving skills and selecting the best tools and strategies to approach a problem.

Chapter 9 goes into more details on these skills and includes examples with answers or explanations. Each set of examples is followed by a set of exercises.

Communicating

Communicating is the process of expressing mathematical ideas and understandings orally, visually, and in writing. This is done by using numbers, symbols, pictures, graphs, diagrams, and words. It is important that you are able to **communicate** to express, describe, explain, and apply mathematical ideas in several different ways. Using this as a tool should help you in describing, creating, and interpreting relationships.

Representing

We **represent** mathematical relationships with the use of drawings, physical models, equations, charts, and graphs. Being able to represent mathematical ideas in different ways and making connections among them to solve problems are important skills.

Connecting and Relating

Connecting involves **relating** mathematical concepts to each other. It also involves making mathematical connections to the real world.

Reasoning and Proving

The ability to understand the relationships that apply to numbers, shapes, or operations is called mathematical **reasoning**. Steps involved in this process include defining the relationship, analyzing why it is true, and determining if it can be applied to numbers, shapes, or operations.

CODING

Learning how computers follow instructions is an important part of **coding** in mathematics. It involves writing a set of instructions that a computer understands. Chapter 10 will help to strengthen the coding knowledge that students already have. It will build on the use of control structures to simplify code.

CHAPTER 1
NUMBER CONCEPTS

If you need additional help, there are more resources available at www.dynamicmath.ca.

1.1 Place Value

Numbers up to 1 000 000

When numbers are written with digits, they are called numerals (320 000). When we read these numbers using words, they are called number words (three hundred twenty thousand).

To gain a better understanding of numbers, it is important to know what the value of each digit is. We do this with place value, which you have used.

Example: The number **538 094** is shown with the place value for each of its digits.

5	**3**	**8**	**0**	**9**	**4**
↑	↑	↑	↑	↑	↑
hundred thousands	ten thousands	thousands	hundreds	tens	ones

five hundred thirty-eight thousand   zero hundreds   ninety-four

The above numeral (number) has 5 <u>hundred thousands</u>, 3 <u>ten thousands</u>, 8 <u>thousands</u>, 0 <u>hundreds</u>, 9 <u>tens</u>, and 4 <u>ones</u>. When we describe the numeral with a number word, we usually combine the thousands, and the tens and ones. The **number word** is five hundred thirty-eight thousand ninety-four.

Examples with Solutions

1. Which digit is located in each of the following place-values for the numeral **729 438**?

    a. hundred thousands   7, which represents 7 hundred thousand.

    b. ten thousands   2, which represents 20 thousand.

    c. thousands   9, which represents 9 thousand.

    d. hundreds   4, which represents 4 hundreds.

    e. tens   3, which represents 3 tens.

    f. ones   8, which represents 8 ones.

2. Write number words for the following numerals.

    a. 235 608   <u>235</u> <u>6</u>08
                                      There are 235 thousands (2 hundred thousands, 3 ten thousands, and 5 one thousands), 6 hundreds, and 8 ones. The number word is two hundred thirty-five thousand six hundred eight.

b. 365 240

<u>365</u> <u>240</u>
There are 365 thousands (3 hundred thousands, 6 ten thousands, and 5 one thousands), two hundreds, and 4 tens (or forty). The number word is three hundred sixty-five thousand two hundred forty.

c. 560 032

<u>560</u> <u>032</u>
There are 560 thousands, 3 tens and 2 ones (or thirty-two). The number word is five hundred sixty thousand thirty-two.

3. Write the following number words as numerals.

a. eight hundred thirty thousand eight hundred forty-seven   830 847

b. seventy thousand fifteen   70 015

c. one hundred twenty thousand two hundred six   120 206

d. seven hundred five thousand thirty-four   705 034

When we write numbers with <u>more</u> than 4 digits, we use a space instead of a comma to separate groups of three. This is done because Canada has adopted the metric system and in many other countries a comma is used as a decimal point.

Examples:

1. 27 500 instead of 27,500

2. 345 420 instead of 345,420

3. 3540 instead of 3,540 (We don't leave a space if there are only 4 digits.)

Exercises 1.1a

1. What is the value of the digit asked for in each of the following numbers?

a. 405 632   digit 6

    b. 140 670   digit 7

    c. 840 035   digit 8

    d. 302 670   digit 2

    e. 86 075   digit 8

2. Write the numeral for each number word.

    a. three hundred ten thousand thirty

    b. five hundred three thousand four hundred twenty-one

    c. seventy thousand seventy

    d. five hundred thousand five

    e. six thousand six

    f. forty thousand fifteen

    g. twenty thousand three hundred

    h. one hundred thousand one hundred one

3. Write the number word for each numeral.

    a. 506 320

    b. 35 028

    c. 60 060

    d. 505 055

    e. 10 001

    f. 33

    g. 1001

    h. 77 007

4. The distance from the earth to the moon is about 384 403 km. Write this numeral as a number word.

5. A provincial park has about two hundred twenty-three thousand six hundred trees in it. Write this number word as a numeral.

Exciting Extras   **Who Am I?**

6. I am a number with 6 digits. My ones digit is 6 and my tens digit is one less. My other four digits are all one less than my tens digit.

7. I have 6 digits. All of my digits are the same and their sum is 12.

8. I have 6 digits. Both my hundred-thousands digit and my ones digit are equal to 5. Each of the digits in between are two less than five.

9. I have six digits, each of which is equal. My digits sum to 18.

10. I am greater than one hundred thousand but less than one hundred thousand one hundred. I have a total of six digits and all of them are either zeros or ones. My digits sum to 2. What possible numbers am I?

11. I have 6 digits. My hundred-thousands digit is 3 and all other digits to the right of it are one more than the digit on its left. What number am I?

12. There are five digits in my number. The first and the last are 1. The second is twice the sum of the first and last, the third is half the second and the fourth is one more than the third. What number am I?

Working with Thousandths

The Decimal Point

In our decimal system of numbers, digits can be placed to the left or to the right of a **decimal point**. Numbers to the left are equal to or greater than one, and numbers to the right are less than one.

Place Value and the Decimal Point

To the **right** of the ones column is a decimal point, followed by the columns corresponding to place values of tenths, hundredths, and thousandths.

Example: The number 725.135 is shown with the place value for each of its digits below.

7	2	5	.	1	3	5
↑	↑	↑	↑	↑	↑	↑
hundreds	tens	ones	decimal point	tenths	hundredths	thousandths

seven hundred   twenty-five   and   one hundred thirty-five thousandths

The above **numeral** (number) has 7 hundreds, 2 tens, 5 ones, 1 tenth, 3 hundredths, and 5 thousandths. The **number word** is seven hundred twenty-five **and** one hundred thirty-five thousandths.

Writing Decimal Numerals and Decimal Number Words

We use the word "**and"** to represent the decimal point.

Example: Write each of the following numerals as a number word.

Numeral	Number word
7.9	seven **and** nine tenths
81.04	eighty-one **and** four hundredths
357.019	three hundred fifty-seven **and** nineteen thousandths
105.21	one hundred five **and** twenty-one hundredths
261.011	two hundred sixty-one **and** eleven thousandths
500.007	five hundred **and** seven thousandths
205 000.04	two hundred five thousand **and** four hundredths

Examples with Solutions

1. Which digit is located in each of the following place values for the numeral **3005.267**?

   a. thousands   3, which represents 3 thousands.

b. hundreds	0, which represents zero hundreds.
c. tens	0, which represents zero tens.
d. ones	5, which represents 5 ones.
e. tenths	2, which represents 2 tenths.
f. hundredths	6, which represents 6 hundredths.
g. thousandths	7, which represents 7 thousandths.

2. Write number words for the following numerals.

    a. 30.501

    30.501
The number is thirty <u>and</u> five hundred one thousandths.

    b. 9.05

    9.05
The number is nine <u>and</u> five hundredths.

    c. 1033.054

    1033.054
The number is one thousand thirty-three <u>and</u> fifty-four thousandths.

    d. 23 006.03

    23 006.03
The number is twenty-three thousand six <u>and</u> three hundredths.

Exercises 1.1b

1. What is the value of each of the following digits in the number **23.468?**

    a. 2

    b. 4

    c. 6

    d. 8

    e. 3

2. Write each of the following numerals as number words.

    a. 25.015   b. 250.006

c. 45.111

d. 2300.508

e. 250.013

f. 3030.03

g. 1003.003

h. 7000.077

i. 205 000.29

j. 310 005.6

3. Write each of the following number words as numerals.

a. three hundred fifty and twenty-nine thousandths

b. forty-five and forty-five thousandths

c. two hundred five and two hundredths

d. seven thousand five hundred and seventy-five thousandths

e. one hundred thousand ten and one tenth

f. six hundred thousand six and six hundredths

    g. one hundred thousand one hundred one
       and one hundredth

Exciting Extras

4. Find each of the following numbers based on their descriptions.

    a. My thousandths digit is 8. My hundredths digit is half my thousandths, my tenths digit is half my hundredths, and my ones digit is half my tenths digit. I have four digits altogether. Who am I?

    b. I have 4 digits altogether. My thousandths digit is the same as my tenths and my ones digits. My hundredths digit is zero. All of my digits sum up to twenty-one. Who am I?

    c. I have a total of 5 digits. My ones digit is 3. My tens digit, which is one more than my ones, is twice my tenths digit. My hundreds digit, which is two more than my tens digit, is six times my hundredths digit. Who am I?

1.2 Rounding Numbers

Estimating Answers

Estimation is used in many situations where we don't need an exact answer. For example, we may want to estimate how much money to bring to the grocery store in order to buy groceries, how much lawn seed is needed for a lawn, or how much paint is needed to paint the house.

Rounding Numbers

It is often helpful to **round** numbers before we estimate. For example, if we estimate how much the groceries in our grocery cart will cost, we may want to round each item to the nearest dollar first and then find the sum.

Rules for Rounding

Rounding involves place value. Use the following steps to round numbers.

1. Go to the column immediately <u>to the right</u> of the digit in the location of the place value asked for.
2. Round <u>up</u> if that digit is 5 or greater (5 to 9) or leave it the same if it is less than 5 (0 to 4).
3. Replace digits to the right of the place value asked for with zero.

Example: Round 234.637 to

hundreds	tens	ones	decimal	tenths	hundredths	thousandths
3	8	2	.	6	3	7

<table>
<tr><td></td><td style="text-align:center">Process</td><td style="text-align:center">Answer</td></tr>
<tr><td>a. the nearest ten</td><td>Go to the ones column. It is 4, so leave the tens digit the same and replace digits to the right with zero.</td><td>230.000 or 230</td></tr>
<tr><td>b. the nearest one</td><td>Go to the <u>tenths</u> column. It is 6, so round the ones digit <u>up</u> to 5 and replace digits to the right with zero.</td><td>235.000 or 235</td></tr>
<tr><td>c. the nearest tenth</td><td>Go to the <u>hundredths</u> column. It is 3, so leave the tenth digit the same and replace digits to the right with zero.</td><td>234.600 or 234.6</td></tr>
<tr><td>d. the nearest hundredth</td><td>Go to the <u>thousandths</u> column. It is 7, so round the hundredths column up to 4 and replace digits to the right with zero.</td><td>234.640 or 234.64</td></tr>
</table>

Examples with Solutions

1. Round 353.681 as follows:

    a. to the nearest one

Go to the <u>tenths</u> column (it is 6). Round the ones column up to 4. The answer becomes 354.

    b. to the nearest tenth

Go to the <u>hundredths</u> column (it is 8). Round the tenths column up to 7. The answer becomes 353.7.

    c. to the nearest hundredth

Go to the <u>thousandths</u> column (it is 1). Leave the hundredths the same and replace digits to the right with zero. The answer becomes 353.680 or 353.68.

2. Round 709.163 as follows:

    a. to the nearest one

Go to the <u>tenths</u> column (it is 1). Leave the ones the same and replace digits to the right with zero. The answer becomes 709.000 or 709.

    b. to the nearest tenth

Go to the <u>hundredths</u> column (it is 6). Round the tenths column up to 2. The answer becomes 709.2.

    c. to the nearest hundredth

Go to the <u>thousandths</u> column (it is 3). Leave the hundredths the same and replace digits to the right with zero. The answer becomes 709.160 or 709.16.

Exercises 1.2

1. Round 53.458 as follows

    a. to the nearest one   b. to the nearest tenth

    c. to the nearest hundredth

CHAPTER 10
CODING

10.1 The Structure of Coding

10.2 Control Structures

10.3 Writing Code in *Scratch*

Coding at the Grade 6 Level

In Grade 6, we continue to build on your knowledge of coding while focussing on creating efficient code.

The examples and exercises in this chapter will rely on your knowledge of topics that we explored in previous chapters. We recommend that you complete those chapters before doing this chapter on coding.

This chapter provides explanations, examples, and practice questions that do not require the use of a computer or other technology. It also includes references to some optional online resources and tools that you can use to practice writing your own code using a free coding platform. Internet access will be needed to participate in the optional online part of this chapter.

The free coding platform that is used is called *Scratch.* This program makes use of coding blocks that you can drag and drop to create your own code and execute it on the screen. We use screenshots of these coding blocks in this chapter.

It is okay if access to the Internet is not possible, as all the topics are covered directly in this book. You will probably enjoy this unit more if you are able to create your own code and test it online.

Scratch is part of the MIT Media Lab and is free to use. (https://scratch.mit.edu)

10.1   The Structure of Coding

Do you know what a recipe book and video game have in common? They are both made up of algorithms. An **algorithm** is a set of instructions that will produce a specific result. The recipe to make chocolate chip cookies is an algorithm, as are the many lines of instructions that make up a video game. The only difference is that the recipe is written in language that people can easily understand. The algorithms that make up a video game are written in a very specific computer language called **code**.

When we are **coding**, we are writing a set of instructions that a computer can understand. We need to be very specific in our instructions because a computer can't think for itself. Whatever you tell a computer to do, it will do it exactly as it is written.
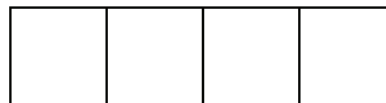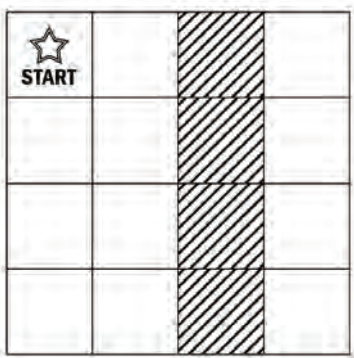
Computer programs are everywhere. They are in the smallest of microchips and the largest of supercomputers. They are in your electric toothbrush, your fridge, your headphones, and many other items you use on a daily basis. Regardless of whether it is a simple algorithm or a complex network of algorithms, they all need to be as efficient as possible.

We create efficient programs by simplifying the code by removing unnecessary extra steps, and by using control structures such as loops and conditional statements to reduce the amount of code the computer needs to process.

The goal is to create the most efficient code, but don't let this get in the way of your creativity. You can always go back over your code and look for areas where you can simplify the code to make it more efficient.

Example: Can you create an algorithm that produces the pattern below using only four symbols? You can place 1 symbol in each box. To create a loop, circle the boxes and state the number of times to repeat them.

ANSWERS TO

EXERCISES AND

CHAPTER TESTS

CHAPTER 1

Exercises 1.1a (page 3)
1. a) 600   **b)** 70   **c)** 800 000   **d)** 2000
e) 80 000   **2. a)** 310 030   **b)** 503 421
c) 70 070   **d)** 500 005   **e)** 6006   **f)** 40 015
g) 20 300   **h)** 100 101   **3. a)** five hundred six
thousand three hundred twenty   **b)** thirty-five
thousand twenty-eight   **c)** sixty thousand sixty
d) five hundred five thousand fifty-five   **e)** ten
thousand one   **f)** thirty-three   **g)** one thousand
one   **h)** seventy-seven thousand seven   **4.** three
hundred eighty-four thousand four hundred
three   **5.** 223 600   **6.** 444 456   **7.** 222 222
8. 533 335   **9.** 333 333   **10.** 100 010 or 100 001
11. 345 678   **12.** 14 231

Exercises 1.1b (page 8)
1. a) 20   **b)** $\frac{4}{10}$ or 0.4   **c)** $\frac{6}{100}$ or 0.06   **d)** $\frac{8}{1000}$ or
0.008   **e)** 3   **2. a)** twenty-five and fifteen
thousandths   **b)** two hundred fifty and six
thousandths   **c)** forty-five and one hundred
eleven thousandths   **d)** two thousand three
hundred and five hundred eight thousandths
e) two hundred fifty and thirteen thousandths
f) three thousand thirty and three hundredths
g) one thousand three and three thousandths
h) seven thousand and seventy-seven
thousandths   **i)** two hundred five thousand and
twenty-nine hundredths   **j)** three hundred ten
thousand five and six tenths   **3. a)** 350.029
b) 45.045   **c)** 205.02   **d)** 7500.075
e) 100 010.1   **f)** 600 006.06   **g)** 100 101.01
4. a) 1.248   **b)** 7.707   **c)** 643.21

Exercises 1.2 (page 12)
1. a) 53   **b)** 53.5   **c)** 53.46   **2. a)** 600   **b)** 610
c) 607   **d)** 607.1   **e)** 607.05   **3.** 130   **4.** 1900
5. $123.30   **6.** 35.81   **7.** 5, 6, 7, 8 or 9
8. 0, 1, 2, 3 or 4   **9.** 5, 6, 7, 8 or 9
10. 0, 1, 2, 3 or 4

Exercises 1.3 (page 15)
1. 3000   **2.** $40 000   **3.** 89 000   **4.** 960 000
5. About 721 000   **6.** $426 000

Exercises 1.4 (page 22)
1. a) 5, 71   **b)** 7, 29   **c)** 3, 73   **d)** 11, 31
e) 13, 23, 43, 53   **f)** 5   **2. a)** 1, 2, 4, 5, 8, 10, 20,
40; 2, 5   **b)** 1, 5, 11, 55; 5, 11   **c)** 1, 2, 5, 7, 10,
14, 35, 70; 2, 5, 7   **d)** 1, 2, 4, 5, 10, 20, 25, 50,
100; 2, 5   **e)** 1, 3, 5, 15, 25, 75; 3, 5
3. a) $40 = 2 \times 2 \times 2 \times 5$ **b)** $55 = 5 \times 11$
c) $70 = 2 \times 5 \times 7$ **d)** $100 = 2 \times 2 \times 5 \times 5$
e) $75 = 3 \times 5 \times 5$ **4.** a) and c) show multiples of
the first number. All of the numbers in the
pattern are evenly divisible by the first number.
5. a) 36, 42, 48; The numbers are multiples of 6.
b) 42, 49, 56; The numbers are multiples of 7.
6. a) prime   **b)** composite   **c)** prime
d) composite   **e)** composite   **f)** composite
7. 2, 3, 5, 7, 11, 13, 17, 19   **8. a)** 1, 5, 25
b) 1, 3   **9. a)** 35, 70   **b)** 24, 48, 72, 96
10. 1, 2, 4   **11.** 1, 6   **12.** 30, 60, 90   **13.** 2
14. 66, 72, 78, 84, 90, 96   **15.** 210

Exercises 1.5 (page 27)
1. GCF = 4, LCM = 224   **2.** GCF = 4,
LCM = 240   **3.** LCM = 60   **4.** GCF = 14
5. GCF = 15, LCM = 1050   **6.** GCF = 3,
LCM = 420   **7.** 60 minutes   **8.** 35 or 105
9. 7   **10.** 5   **11.** 10, 20, 40   **12.** 15 and 30
13. a) 9:00 am   **b)** Bus A will have completed 3
trips.   **c)** Bus B will have completed 2 trips.

Exercises 1.6 (page 31)
1. a) proper   **b)** improper   **c)** proper
d) improper   **e)** improper   **f)** proper
g) improper   **h)** proper   **i)** improper   **j)** proper
k) improper   **l)** improper   **m)** improper
n) proper   **2. a)** $\frac{5}{2}$ **b)** $\frac{11}{3}$ **c)** $\frac{41}{8}$ **d)** $\frac{21}{5}$ **e)** $\frac{101}{10}$
f) $\frac{101}{5}$ **g)** $\frac{33}{5}$ **h)** $\frac{103}{20}$ **i)** $\frac{1003}{10}$ **j)** $\frac{85}{4}$ **k)** $\frac{63}{4}$ **l)** $\frac{69}{8}$
m) $\frac{12}{11}$ **n)** $\frac{601}{20}$ **3. a)** $1\frac{1}{3}$ **b)** $1\frac{2}{3}$ **c)** $1\frac{1}{8}$ **d)** $1\frac{4}{7}$
e) $1\frac{2}{7}$ **f)** $4\frac{1}{2}$ **g)** $2\frac{1}{3}$ **h)** $4\frac{1}{3}$ **i)** $2\frac{2}{3}$ **j)** $3\frac{1}{10}$ **k)** $3\frac{1}{7}$
l) $2\frac{3}{13}$ **m)** $5\frac{5}{9}$ **n)** $1\frac{1}{999}$ **4.** $\frac{8}{6}$ or $\frac{9}{7}$ **5.** $\frac{5}{2}, \frac{7}{4}, \frac{8}{5}, \frac{9}{6}$
6. $1\frac{1}{2}$ **7.** $3\frac{1}{4}$ **8.** $7\frac{3}{4}$

Special Project (page 34)
1. $\frac{7}{8}$ **2.** $\frac{1}{15}$ **3.** $\frac{15}{2}$ **4.** $\frac{8}{7}$ **5.** $15\frac{7}{8}$ **6.** $1\frac{2}{15}$

Dynamic Math Videos

The Dynamic Math Program supports the teacher to confidently teach their students with:

- a curriculum aligned **Math book**
- **online teacher resources** such as worksheets and extra tests with answer keys
- a **digital flipbook**
- **a library of videos** to help the student in their math journey.

Our program is designed to have the videos support our Math books which are clear, concise and 100% aligned to the provincial curriculum.

Many schools purchase class sets of our Math books and licenses to provide access to the videos. The videos are designed to help the student get 'unstuck' when they are doing their homework. Each video matches the related section in the Math book so that it is easy for the student to find.

Through the licensing process, access to all available grades is offered to each subscriber, allowing students to go back to previous years to review and enhance their understanding or work ahead for advanced learning.

The video program is not designed for each student to watch all available videos for their grade level. Some students may only need to watch some videos throughout the year as they already have a strong grasp of the math concepts being taught in the classroom. Students can do this at home for homework and will not fall behind as they have some extra guidance.

This combination of book and video instruction improves learning outcomes and makes students more confident.

In summary, please consider the following:

Video Benefits for you and your students

- They will help support you in teaching Math to your students.
- The videos will help your students to reinforce what you taught them in the classroom.
- They will be more confident when doing their homework.
- They will equip parents to help the student at home.
- They will dramatically increase the success of your students to learn math.

At a Glance

- Videos available for Grades 4-10, 50-80 Videos per grade, 2 to 7 minutes in length
- The videos match the chapters and units in our Math books and help instruct students learn how to complete the questions in the books.
- Videos are 100% aligned to the provincial curriculum.

DYNAMIC CLASSROOM MATH PROGRAM

The Dynamic Classroom Math book series provides students with curriculum-based resources written by Canadian Math teachers. Our complete series of Math books will take students step by step through the entire provincial curriculum, providing clear instruction, guided examples, and lots of practice questions. All of our Dynamic Math books are fully supported with additional online resources available at **www.dynamicmath.ca**.

BOOKS
The Dynamic Classroom Math books are 100% aligned to the mathematics curriculum for each province. Our Math books include:

- Clear and concise instructions that explain each topic and how to approach the questions
- Step-by-step guided examples that show students how to answer questions
- Practice questions that range from easy to advanced
- Chapter tests to help assess students' knowledge and understanding
- An answer key for all exercises and tests

VIDEO
Dynamic Classroom has a growing library of Math video lessons that will help your child with over-the-shoulder instruction. Each video aligns with a specific section in our Math book for that grade. Visit our website to access a free trial and for more information about subscriptions.

EXTRA ONLINE CONTENT
In an effort to help teachers in the classroom and equip students to enhance learning, we offer additional online content. Visit our website for extra resources and the latest updates.

OUR MISSION
We work to create clear, concise, and straightforward educational resources for teachers and parents to teach confidently and effectively, and to empower students to achieve learning goals in the classroom and at home.

DYNAMIC MATH