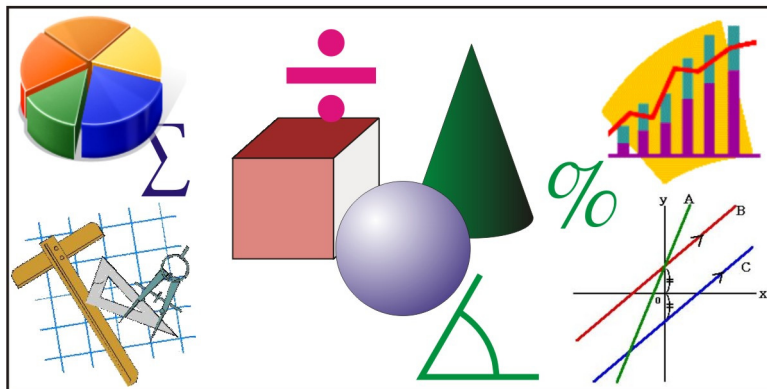


RAVEN'S CORE GRADE 8
(LITERACY FOUNDATIONS LEVEL 5)

MATHEMATICS PROGRAM

**STUDENT GUIDE AND
RESOURCE BOOK**



The Key to Student Success

One of a series of publications by Raven Research Associates
for Secondary and Elementary Mathematics

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Raven Research Associates
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Introduction

This book is intended to assist students with the core content for Mathematics Grade 8 and/or Mathematics Literacy Level 5. It is linked to the provincial mathematics curriculum and designed by experienced teachers of mathematics to provide students with greater success in these courses. It includes the following features:

- Clear Descriptions of the Key Concepts
- Numerous Examples with Step-by-Step Solutions
- Many Practice Exercises to Reinforce Understanding and Application
- Review Exercises with a Range of Difficulty Levels
- All Answers which are listed at the Back of the Book
- Produced by Experienced Teachers of Mathematics
- Attractively Bound and Formatted for Clarity and Ease of Access

The program is designed for the following:

- (i) Students in the regular program taking a MATH 8 COURSE and preparing to take a MATH 9 COURSE of studies in the regular school program OR
- (ii) Adult students enrolled in LITERACY FOUNDATIONS OF MATH AT LEVEL 5 and preparing to take LEVEL 6.

The core content areas listed in the Table of Contents, shown in the next page, are linked to prescribed learning outcomes for Mathematics Literacy Level 5. The following list of prescribed outcomes and corresponding codes from A1 to D2 are listed next.

NUMBER

A1 demonstrate an understanding of multiplication and division of fractions with like and unlike denominators concretely, pictorially, and symbolically	pictorially, and symbolically
A2 determine the relationship between positive repeating decimals and positive fractions (e.g., $1/3$) and positive terminating decimals and positive fractions (e.g., $1/8$)	A7 demonstrate an understanding of powers as repeated multiplication and explain the meaning of the base, coefficient, and exponent in a power
A3 compare and order positive fractions, decimals, and whole numbers using benchmarks (e.g., 0, $1/2$, 1)	A8 write powers as the product of factors and explain their meaning
A4 solve problems involving the application of ratios and proportions	A9 evaluate expressions involving powers with integral bases
A5 solve problems involving percentages and justify the solution	A10 demonstrate an understanding of exponent rules for the multiplication and division powers to solve problems
A6 explain the process for addition, subtraction, multiplication, and division of integers concretely,	A11 express a given number using scientific notation
	A12 simplify expressions, including exponents, using order of operations

PATTERNS AND RELATIONS

Patterns B1 represent algebraic expressions and equations in words B2 represent and describe patterns and relationships using graphs and a table of values	B4 solve problems involving one- and two-step equations limited to equations of the form $\chi + a = b$, $a\chi = b$, and $a\chi + b = c$
Variables and Equations B3 apply and explain how preservation of equality is used to solve equations	B5 distinguish between expressions and equations and explain the similarities and differences B6 evaluate an expression given the value of the variable

SHAPE AND SPACE

Measurement C1 explain the process for determining the circumference and area of a circle 3-D Objects and 2-D Shapes C2 calculate the volume of triangular prisms, cylinders, cones, and pyramids	Transformations C3 identify and plot points in the four quadrants of a Cartesian plane using ordered pairs
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STATISTICS AND PROBABILITY

Data Analysis D1 read, interpret, and construct line graphs from a given data set	Chance and Uncertainty D2 express and interpret probabilities as ratios, fractions, or percents
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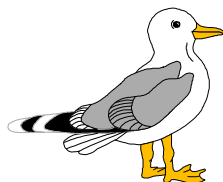
***SAMPLE FROM RAVEN'S CORE MATH 8
(LITERACY FOUNDATIONS LEVEL 5)***

3.6.7 Word Problems Involving Equations of Form $ax + b = c$

- We will use the same steps in solving word problems with equations of form $ax + b = c$ as we did with word problems involving other forms of equations. These steps are shown once again.

Steps to Solve a Word Problem

- | | |
|---|--|
| 1. What is the question? | 1. <i>Read the question carefully to identify what is asked for.</i> |
| 2. What are you told about the question? | 2. <i>Look at the information to see what it tells about the question.</i> |
| 3. Write a mathematical equation. | 3. <i>Write a mathematical equation that describes the information.</i> |
| 4. Find the value of the variable or placeholder. | 4. <i>Find a number value that makes the equation true.</i> |
| 5. Check the answer. | 5. <i>Check to make sure the value works.</i> |
| 6. Write a concluding word statement. | 6. <i>Write a concluding statement that answers the question</i> |



Example 1:

Brenda and Cindy went for a walk on the beach and counted seagulls. Cindy counted 11 seagulls, which was one more than twice as many as Brenda. How many seagulls did Brenda count?

- | | |
|--|---|
| 1. What is the question? | 1. <i>How many seagulls did Brenda count? (let it be equal to x)</i> |
| 2. What are you told about the question? | 2. <i>Cindy counted 11 seagulls, which was one more than twice as many as Brenda.</i> |
| 3. Write a mathematical equation. | 3. $2x + 1 = 11$ |
| 4. Find the value of the variable. | 4. $x = 5$ (subtract 1 from both sides first, then multiply by one half) |
| 5. Check the answer. | 5. $2 \cdot 5 + 1 = 11$; $11 = 11$ ✓ |
| 6. Write a concluding statement. | 6. <i>Brenda counted 5 seagulls.</i> |



Example 2

Charlene and Erica each took a taxi from their houses to the airport. Charlene travelled a distance of 34 km, which was two kilometres less than three times as far as Erica. How far did Erica travel by taxi?

- | | |
|--|--|
| 1. What is the question? | 1. <i>How far did Erica travel by taxi?
(let it be equal to x)</i> |
| 2. What are you told about the question? | 2. <i>Charlene travelled a distance of 34 km, which was 2 less than 3 times as far as Erica.</i> |
| 3. Write a mathematical equation. | 3. $3x - 2 = 34$ |
| 4. Find the value of the variable. | 4. $x = 12$ (add 2 to both sides first, then multiply by one third) |
| 5. Check the answer. | 5. $3 \bullet 12 - 2 = 34$; $34 = 34 \checkmark$ |
| 6. Write a concluding statement. | 6. <i>Erica travelled a distance of 12 km by taxi.</i> |
-

Exercises 3.6.7

For each of the following problems choose a variable, write the equation, solve it and then answer the question.

1. If a number is multiplied by three and four is added to the product, the result is thirteen. What is the number?
2. Twice a number is five more than seven. What is the number?
3. If a number is doubled and five is subtracted from the product, the result is nine. What is the number?
4. The sum of six times a number and five, is twenty three. What is the number?

5. Brenda has two more than three times as many candies as Erica. If she has 17 candies, how many does Erica have?

6. Bob bought three more than twice as many apples as Kathy. If Bob bought 11 apples, how many did Kathy buy?

7. Ben is 10 kg more than twice Gloria's mass. If Ben's mass is 46 kg then what is Gloria's mass?

8. Eric bought 4 CDs less than twice the number that his sister bought at a garage sale. If Eric bought 12 CDs then how many did his sister buy?

9. A bag of oranges contains 14 oranges. The produce department had 37 oranges to start with but after the shipment had a total of 359 oranges. How many bags came in on the shipment?

10. Alan and Bill went fishing and each caught a wild salmon. Alan's fish weighed 130 grams more than three times as much as Bill's fish. If Alan's fish weighed 7 kg then what did Bill's fish weigh?

11. ***"How old are you?"*** Jan asked Bill.

After a short pause, Bill replied,

"If you double my age and add eight, the result is thirty six."

How old is Bill?

12. ***"What is the cost of an orange?"*** Sue asked the store clerk.

"If you buy two oranges and give me a dime, I will give you forty cents change from two dollars", replied the store clerk.

How much does one orange cost?