

Section 1.3 Modeling with Linear Equations

Objective: In this lesson you learned how to write and use mathematical models to solve real-life problems.

Course Number

Instructor

Date

I. Introduction to Problem Solving (Pages 97–98)

The process of translating phrases or sentences into algebraic expressions or equations is called _____.

A good approach to mathematical modeling is to use two stages.

Begin by . . .

Then, after assigning labels to the quantities in the verbal model, . . .

Some key words or phrases that represent equality are . . .

Some key words or phrases that represent addition are . . .

Some key words or phrases that represent subtraction are . . .

Some key words or phrases that represent multiplication are . . .

Some key words or phrases that represent division are . . .

What you should learn

How to use a verbal model in a problem-solving plan

II. Using Mathematical Models (Pages 98–100)

Example 1: Describe a strategy for solving and then solve the following problem: Tuition payments make up 67% of a college student's annual income. If the student pays \$8375 for tuition in a single year, what is her annual income?

What you should learn

How to write and use mathematical models to solve real-life problems

III. Mixture Problems (Page 101)

Give an example of a mixture problem.

What you should learn
How to solve mixture problems

Describe a general strategy for solving mixture problems.

IV. Common Formulas (Pages 102–103)

Many common types of geometric, scientific, and investment problems use ready-made equations called _____.

What you should learn
How to use common formulas to solve real-life problems

Complete the following list of common formulas for basic geometric figures.

Perimeter/Circumference

Square with side length s : $P =$ _____

Rectangle with width w and length l : $P =$ _____

Triangle with sides a , b , and c : $P =$ _____

Circle with radius r : $C =$ _____

Area

Square with side length s : $A =$ _____

Rectangle with width w and length l : $A =$ _____

Triangle with base b and height h : $A =$ _____

Circle with radius r : $A =$ _____

Volume

Cube with side length s : $V =$ _____

Rectangular solid with width w , length l , and height h : $V =$ _____

Circular cylinder with radius r and height h : $V =$ _____

Sphere with radius r : $V =$ _____

Complete the following list of miscellaneous common formulas.

Temperature

where F = degrees Fahrenheit and C = degrees Celsius

$$F = \underline{\hspace{2cm}}$$

Simple Interest

where I = interest, P = principal, r = annual interest rate, and
 t = time in years

$$I = \underline{\hspace{2cm}}$$

Compound Interest

where A = balance, P = principal, r = annual interest rate,
 n = compoundings per year, and t = time in years

$$A = \underline{\hspace{2cm}}$$

Distance

where d = distance traveled, r = rate, and t = time

$$d = \underline{\hspace{2cm}}$$

Additional notes**Homework Assignment**

Page(s)

Exercises

