

## Section 1.2 Equations and Solutions of Equations

**Objective:** In this lesson you learned how to identify and solve linear equations in one variable.

Course Number

Instructor

Date

### Important Vocabulary

Define each term or concept.

**Equation in one variable**

**Solution of equation in one variable**

**Identity equation**

**Conditional equation**

**Equivalent equations**

**Extraneous solution**

### I. Equations and Solutions of Equations (Page 88)

To **solve** an equation in  $x$  means to . . .

The values of  $x$  for which the equation is true are called its \_\_\_\_\_.

**Example 1:** Identify which of the following equations are equations in one variable.

- (a)  $7 + 6x = 5x - 4$       (b)  $9x + 5y = -3$   
 (c)  $I = prt$                 (d)  $8 = 3x^2 + 4x + 5$

#### *What you should learn*

How to identify different types of equations

### II. Linear Equations in One Variable (Pages 88–90)

A **linear equation in one variable**  $x$  is an equation that can be written in the standard form \_\_\_\_\_, where  $a$  and  $b$  are real numbers with  $a \neq$  \_\_\_\_\_.

A linear equation has \_\_\_\_\_ solution(s).

An equation can be transformed into an equivalent equation by one or more of the following steps:

(1)

#### *What you should learn*

How to solve linear equations in one variable

(2)

(3)

(4)

If a contradictory statement such as  $9 = 0$  is obtained while solving an equation, then the equation has \_\_\_\_\_.

**Example 2:** Solve  $5(x + 3) = 35$ .

### III. Equations Involving Fractional Expressions (Pages 91–92)

To solve an equation involving fractional expressions, . . .

**What you should learn**  
How to solve equations involving fractional expressions

When is it possible to introduce an extraneous solution?

An equation with a single fraction on each side can be cleared of denominators by \_\_\_\_\_, which is equivalent to multiplying by the LCD and then dividing out.

**Example 3:** Solve: (a)  $\frac{5x}{7} = \frac{9}{14}$     (b)  $\frac{1}{x+1} + \frac{5x}{x^2-1} = \frac{4}{x-1}$

### IV. Applications of Linear Equations (Pages 92–93)

Describe a real-life situation which can be represented by a linear equation.

**What you should learn**  
How to use linear equations to model and solve real-life problems

**Example 4:** The budget of a public library (in thousands of dollars) in a small town can be approximated by the linear model  $y = 5.4x + 13.9$ , where  $x = 0$  represents 2000. Assuming that this pattern continues, find the year when the library's budget reaches \$50,000.

**Homework Assignment**

Page(s)

Exercises