Section 1.4 Quadratic Equations

Objective: In this lesson you learned how to solve quadratic equations.

I. Factoring (Page 109)

To use the Zero-Factor Property to solve a quadratic equation, . . .

Example 1: Solve \( x^2 - 12x = -27 \) by factoring.

II. Extracting Square Roots (Page 110)

Solving an equation of the form \( u^2 = d \) without going through the steps of factoring is called ____________________________.

The equation \( u^2 = d \), where \( d > 0 \), has exactly two solutions:
\[ u = \text{______________} \] and \( u = \text{______________} \). These solutions can also be written as \( u = \text{______________} \).

Example 2: Solve \( 5(x - 4)^2 = 45 \) by extracting square roots.
III. Completing the Square (Page 111)

To complete the square for the expression $x^2 + bx$, add __________, which is the square of half the coefficient of $x$.

When solving quadratic equations by completing the square, you must add this term to _______________ in order to maintain equality.

The completing the square method can be used to solve a quadratic equation when . . .

When completing the square to solve a quadratic equation, if the leading coefficient is not 1, . . .

Example 3: Solve $x^2 + 10x - 8 = 0$ by completing the square.

IV. The Quadratic Formula (Pages 112–113)

The verbal statement of the Quadratic Formula is . . .

When using the Quadratic Formula, remember that before the formula can be applied, . . .

Example 4: For the quadratic equation $16 - 3x = -2x^2$, find the values of $a$, $b$, and $c$ to be substituted into the Quadratic Formula.

The discriminant of the quadratic expression $ax^2 + bx + c$ can be used to . . .
If the discriminant \( b^2 - 4ac \) of the quadratic equation
\[ ax^2 + bx + c = 0, \; a \neq 0, \] is:

1) positive, then the quadratic equation . . .

2) zero, then the quadratic equation . . .

3) negative, then the quadratic equation . . .

**Example 5:** Use the discriminant to find the number and type of solutions of the quadratic equation
\[ 6x^2 - 5x + 18 = 0. \]

**V. Applications of Quadratic Equations** (Pages 114–117)

Describe two real-life situations in which quadratic equations often occur.

The **position equation** giving the height of an object above the Earth’s surface is _________________, where . . .

**Homework Assignment**

Page(s)

Exercises