## Lesson 27

## Foundations of College Algebra

## Recognize Perfect Square Trinomials

Perfect Square Trinomial Pattern

$$a^{2} + 2ab + b^{2} = (a+b)^{2}$$
 and  $a^{2} - 2ab + b^{2} = (a-b)^{2}$ .

Examples

Determine whether the following trinomials are perfect squares.

1. 
$$25v^2 + 10v + 4$$

2. 
$$49x^2 - 28xy + 4y^2$$

Your Turn

Determine whether the following trinomials are perfect squares.

1. 
$$16y^2 + 24y + 9$$

2. 
$$100x^2 - 40x + 1$$

# Factor Perfect Square Trinomials

Examples

Factor completely.

1. 
$$36s^2 + 84s + 49$$

2. 
$$25r^2 - 60rs + 36s^2$$

$$3. 75u^3 - 30u^2v + 3uv^2$$

Your Turn

Factor completely.

1. 
$$49s^2 + 154s + 121$$

2. 
$$64z^2 - 16z + 1$$

3. 
$$10k^2 + 80k + 160$$

4. 
$$64x^2 - 96x + 36$$

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# Factor the Difference of Two Squares

### Difference of Squares Pattern

$$a^{2} - b^{2} = (a + b)(a - b)$$

Examples

Factor each binomial completely.

1. 
$$x^2 - 16$$

2. 
$$49x^2 - 81y^2$$

3. 
$$98r^3 - 72r$$

You Try

Factor each binomial completely.

1. 
$$n^2 - 9$$

2. 
$$25v^2 - 1$$

3. 
$$36p^2 - 49q^2$$

4. 
$$5q^2 - 45$$

# Solve Quadratic Equations by Factoring

The Zero Product Property

If  $a \cdot b = 0$ , then either a = 0, b = 0, or both.

Examples

Solve the equations.

1. 
$$(x+1)(x-4) = 0$$

2. 
$$(5n-2)(6n-1)=0$$

You Try

Solve the equations.

1. 
$$(x-3)(x+7) = 0$$

2. 
$$(3a-10)(2a-7)=0$$

### Definition

The standard form of a quadratic equation is  $ax^2 + bx + c = 0$ . Here, a, b, and c are constants.

#### Procedure

To solve a quadratic equation by factoring:

- Step 1. Write the quadratic equation in standard Step 3. Use the Zero Product Property to write two form.
- Step 2. Factor the quadratic expression.

linear equations.

Step 4. Solve the linear equations.

Step 5: Check.

### Examples

Solve the equations.

1. 
$$y^2 - 8y + 15 = 0$$

3. 
$$144q^2 = 25$$

$$2. \ 2y^2 = 13y + 45$$

4. 
$$(3x - 8)(x - 1) = 3x$$

Solve the equations.

1. 
$$x^2 + 7x + 12 = 0$$

2. 
$$n^2 = 5n - 6$$

3. 
$$4b^2 + 7b = -3$$

4. 
$$4m^2 = 17m - 15$$

5. 
$$49m^2 = 144$$

6. 
$$(y-3)(y+2) = 4y$$

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