

9.6: Perfect Squares and Factoring

[Algebra 1(X)]

HCPS III

- **Standard 10:** Patterns, Functions, and Algebra: SYMBOLIC REPRESENTATION: Use symbolic forms to represent, model, and analyze mathematical situations.
- **Benchmark MA.AI.10.6:** Factor first- and second-degree binomials and trinomials in one or two variables.
- **Benchmark MA.AI.10.7:** Solve quadratic equations in one variable algebraically, graphically, or by using graphing technology.

Objectives(s):

- To factor perfect square trinomials.
- To solve equations involving perfect squares.

Factor Perfect Square Trinomials

Squared binomials form *Perfect Square Trinomials*

e.g., $(3x - 4)^2$ $9x^2 - 24x + 16$

Example 1: Factor Perfect Square Trinomials

Factor each perfect square trinomial.

a.) $9y^2 - 12y + 4$

b.) $9s^2 - 6s + 1$

Factoring Polynomials

# of Terms	Factoring Technique	Example
2 +	Greatest common factor	$3x^3 + 6x^2 - 15x$
2	Difference of Squares $a^2 - b^2 = (a + b)(a - b)$	$4x^2 - 25$
3	Crisscross Method $ax^2 + bx + c$	$6x^2 - x - 2$
4	Factoring by Grouping	$3xy - 6y + 5x - 10$

Example 2: Factor Completely

Factor each polynomial.

a.) $4x^4 - 324$

b.) $6x^2 + 28x - 10$

Solve Equations with Perfect Squares

Example 3: Solve Equations with Repeated Factors

Solve each equation.

a.) $x^2 - x + \frac{1}{4} = 0$

b.) $x^2 + 30x + 150 = -75$

Example 4: Use the Square Root Property to Solve Equations

Solve each equation.

a.) $(b - 7)^2 = 36$

b.) $(a + 4)^2 = 49$

c.) $y^2 + 12y + 36 = 100$

d.) $y^2 - 4y + 4 = 25$

e.) $(x + 9)^2 = 7$

f.) $(x - 3)^2 = 5$