

## R.1 Solving Quadratic Equations

**Quadratic Functions** – Standard Form is  $f(x) = ax^2 + bx + c$  where  $a \neq 0$ .

### Factoring

EXAMPLE: Find the x-intercept by factoring:  $f(x) = x^2 + 7x + 6$

EXAMPLE: Find the x-intercept by factoring:  $f(x) = 3x^2 - 6x - 24$

EXAMPLE: Factor:  $f(x) = 6x^2 - x - 12$

Grouping Method

Bottom's Up (Hervey) Method

EXAMPLE: Solve for x:  $4x^2 - 38x + 70 = 0$

Grouping:

Bottom's Up (Hervey) Method:

EXAMPLE: Find the x-intercept by factoring:  $f(x) = x^2 - 36$

EXAMPLE: Solve by factoring:  $4x^2 = 24x$

EXAMPLE: Solve by factoring:  $(x + 3)(x + 4) = 6$

**Square Root Method**

EXAMPLE: Solve  $0 = (3x - 2)^2 - 4$  by using the square root method.

**Completing the Square**

EXAMPLE: Solve  $x^2 - 6x + 7 = 0$  by completing the square.

EXAMPLE: Solve  $x^2 + 8x - 84 = 0$  by completing the square.

**Quadratic Formula**

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \text{ where } ax^2 + bx + c = 0.$$

EXAMPLE: Solve by using the quadratic formula:  $0 = x^2 + 4x + 2$ .

EXAMPLE: Solve by using the quadratic formula:  $0 = 4x^2 - x + 2$