

Do Now

Solve:  $x^2 + 4x - 12 = 0$  by factoring, completing the square, and by using the quadratic formula.

$= 0$   
Factoring

$$x^2 + 4x - 12 = 0$$

$$(x + 6)(x - 2) = 0$$

$x + 6 = 0$ -6 -6	$x - 2 = 0$ +2 +2
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$x = -6$	$x = 2$
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$$\{-6, 2\}$$

$= \text{Constant}$   
Completing the Square

$$x^2 + 4x - 12 = 0$$

$$x^2 + 4x = 12 \quad b = 4$$

$$x^2 + 4x + \left(\frac{b}{2}\right)^2 = 12 + \left(\frac{b}{2}\right)^2$$

$$x^2 + 4x + \left(\frac{4}{2}\right)^2 = 12 + \left(\frac{4}{2}\right)^2$$

$$x^2 + 4x + 4 = 12 + 4$$

$$x^2 + 4x + 4 = 16$$

$$\sqrt{(x + 2)^2} = \sqrt{16}$$

$$x + 2 = \pm 4$$

$$x + 2 = 4$$

$$x = 2$$

$$x + 2 = -4$$

$$x = -6$$

$$\{-6, 2\}$$

$= 0$   
The Quadratic Formula

$$x^2 + 4x - 12 = 0$$

$$a = 1 \quad b = 4 \quad c = -12$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-4 \pm \sqrt{(4)^2 - 4(1)(-12)}}{2(1)}$$

$$x = \frac{-4 \pm \sqrt{16 - 4(1)(-12)}}{2(1)}$$

$$x = \frac{-4 \pm \sqrt{16 + 48}}{2}$$

$$x = \frac{-4 \pm \sqrt{64}}{2}$$

$$x = \frac{-4 \pm 8}{2}$$

can simplify if you want to  
-2 ± 4 split

$$x = \frac{-4 + 8}{2}$$

$$x = \frac{4}{2}$$

$$x = 2$$

$$x = \frac{-4 - 8}{2}$$

$$x = \frac{-12}{2}$$

$$x = -6$$

$$\{-6, 2\}$$