

Square Root Property

We used the square root property to solve:

$$x^2 - 25 = 0$$

We can also use the square root property to solve trinomial quadratic equations, IF the trinomial is a perfect square.

$$\text{EX: } (x + 3)^2 = 36$$

Solve using the square root property:

$$x^2 + 8x + 16 = 20$$

Solve using the square root property:

$$x^2 - 6x + 9 = 32$$

III Solve for x by completing the square

If one side of an equation contained a perfect square, we can easily solve for the variable. If one side does not contain a perfect square, we can

Complete the Square

Examples of perfect squares:

$$x^2 - 8x + 16$$

$$(x - 4)^2$$

$$x^2 + 4x + 4$$

$$(x + 2)^2$$

Not a perfect square: $x^2 + 4x - 96 = 0$

We will complete the square

COMPLETING THE SQUARE

Step 1 move "c" to right

$$x^2 + 4x = 96$$

Step 2 take half of x-term, square it, and add to both sides

$$x^2 + 4x + 2^2 = 96 + 2^2$$

$$x^2 + 4x + 4 = 100$$

Step 3 Rewrite both sides as perfect squares

$$(x + 2)^2 = 10^2$$

At this point, you can use the square root property to solve for x

Step 4 Solve for x

$$x + 2 = \pm 10$$

$$x + 2 = 10 \quad \text{or} \quad x + 2 = -10$$

$$x = 8 \quad \quad \quad \text{or} \quad \quad \quad x = -12$$

Example:

Solve for x by
completing the square:

$$x^2 - 8x + 11 = 0$$

Solve by completing the square:

$$x^2 + 2x + 2 = 0$$