

Warmup

Factor

$$3x^2 - 300$$

$$8x^2 + 34x - 9$$

Solve by factoring: $3x^2 + 2 = 5x$

$\sqrt{16} = 4 \cdot 4$ $(-4)(-4)$
 $\sqrt{16} = \pm 4$

Completing the Square Graphic Organizer

$$x^2 + 6x + 7 = 0$$

~~+7~~ -7

$$x^2 + 6x + \frac{9}{2} = -7 + \frac{9}{2}$$

$(x + 3)^2 = 2$

$$\sqrt{(x+3)^2} = \sqrt{2}$$

$$x + 3 = \pm \sqrt{2}$$

~~+3~~ -3

$$x = -3 \pm \sqrt{2}$$

$x = -3 + \sqrt{2}$ and
 $x = -3 - \sqrt{2}$

Step 1: move the constant to the other side of the equal sign

*leave + _____ on both sides

*Prepare the ()²

Step 2: divide the middle term (b) by 2, square that number, and then add that number to both sides of the equation

Step 3: "cheat" factor and simplify the right side of the equation

Step 4: take the square root of both sides
 Reminder - square root has + and -

Step 5: solve for x

$\frac{6}{2} = 3$

Let's try some more.

$$1. \quad x^2 - 2x - 15 = 0$$

$$\quad \quad \quad +15 \quad +15$$

$$x^2 - 2x + \frac{1}{1} = 15 + \frac{1}{1}$$

$$\frac{-2}{2} = (-1)^2$$

$$(x - 1)(x - 1) = 16$$

$$\sqrt{(x - 1)^2} = \sqrt{16}$$

$$2. \quad x^2 + 2x - 8 = 0$$

$$\quad \quad \quad +8 \quad +8$$

$$x^2 + 2x + \frac{1}{1} = 8 + \frac{1}{1}$$

$$\frac{2}{2} = (1)^2$$

$$(x + 1)(x + 1) = 9$$

$$\sqrt{(x + 1)^2} = \sqrt{9}$$

$$x + 1 = \pm 3$$

$$3. \quad x^2 - 2x - 1 = 2$$

$$\quad \quad \quad +1 \quad +1$$

$$x^2 - 2x + \frac{1}{1} = 3 + \frac{1}{1}$$

$$\frac{-2}{2} = (-1)^2$$

$$(x - 1)(x - 1) = 4$$

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

$$x - 1 = \pm 2$$

$$4. \quad x^2 + 3x = 40$$

$$\quad \quad \quad +2.25 \quad +2.25$$

$$x^2 + 3x + \frac{2.25}{1} = 40 + \frac{2.25}{1}$$

$$\frac{3}{2} = (1.5)^2$$

$$\sqrt{(x + 1.5)^2} = \sqrt{42.25}$$

$$x + 1.5 = \pm 6.5$$

$$\frac{-1.5}{-1.5} \quad \frac{-1.5}{-1.5}$$

$$x = -1.5 \pm 6.5$$

$$x - 1 = 2 \quad | \quad x - 1 = -2$$

$$\frac{+1}{+1} \quad \quad \quad \frac{+1}{+1} \quad \frac{+1}{+1}$$

$$5. \quad 7x^2 + 14x + 24 = 9$$

$$\quad \quad \quad -24 \quad -24$$

$$\frac{7x^2}{7} + \frac{14x}{7} = -15$$

$$7(x^2 + 2x + \frac{\quad}{7}) = \quad -$$

$$\frac{2}{2} \quad (1)^2 =$$

$$\sqrt{7(x + 1)^2} = \frac{-8}{7}$$

$$\sqrt{(x + 1)^2} = \sqrt{\frac{-8}{7}}$$

$$6. \quad 6x^2 - 12x - 90 = 0$$

$$\quad \quad \quad +90 \quad +90$$

$$\frac{6x^2}{6} - \frac{12x}{6} = 90$$

$$\frac{6(x^2 - 2x + \frac{(-1)^2}{1})}{6} = 90 + \frac{1}{1}$$

$$\frac{(-1)^2}{1} = 1$$

$$\sqrt{6(x - 1)^2} = \frac{96}{6}$$

$$\sqrt{(x - 1)^2} = \sqrt{16}$$

* So we cannot take $\sqrt{-\#}$

No Solution

$$x - 1 = \pm 4$$

$$\frac{+1}{+1} \quad \frac{+1}{+1}$$

$$x = 1 \pm 4 \rightarrow 1 + 4 = 5$$

$$\rightarrow 1 - 4 = -3$$