

Warm up week 3

Solve the equation.

1.
$$\frac{3x^2}{3} = \frac{75}{3}$$

$$\sqrt{x^2} = \sqrt{25}$$

$$x = \pm 5$$

$$x = 5, x = -5$$

2.
$$x^2 + 11 = 36$$

$$\begin{array}{r} -11 \quad -11 \\ \sqrt{x^2} = \sqrt{25} \end{array}$$

$$x = \pm 5$$

Homework Questions?

Self Scoring Scale

4- I can *summarize* the concepts and explain it to others.

3- I can *apply* the concepts to answer questions correctly.

2- I can *apply* the concepts but with some *mistakes*.

1- I *need help* to know how to apply the concepts.

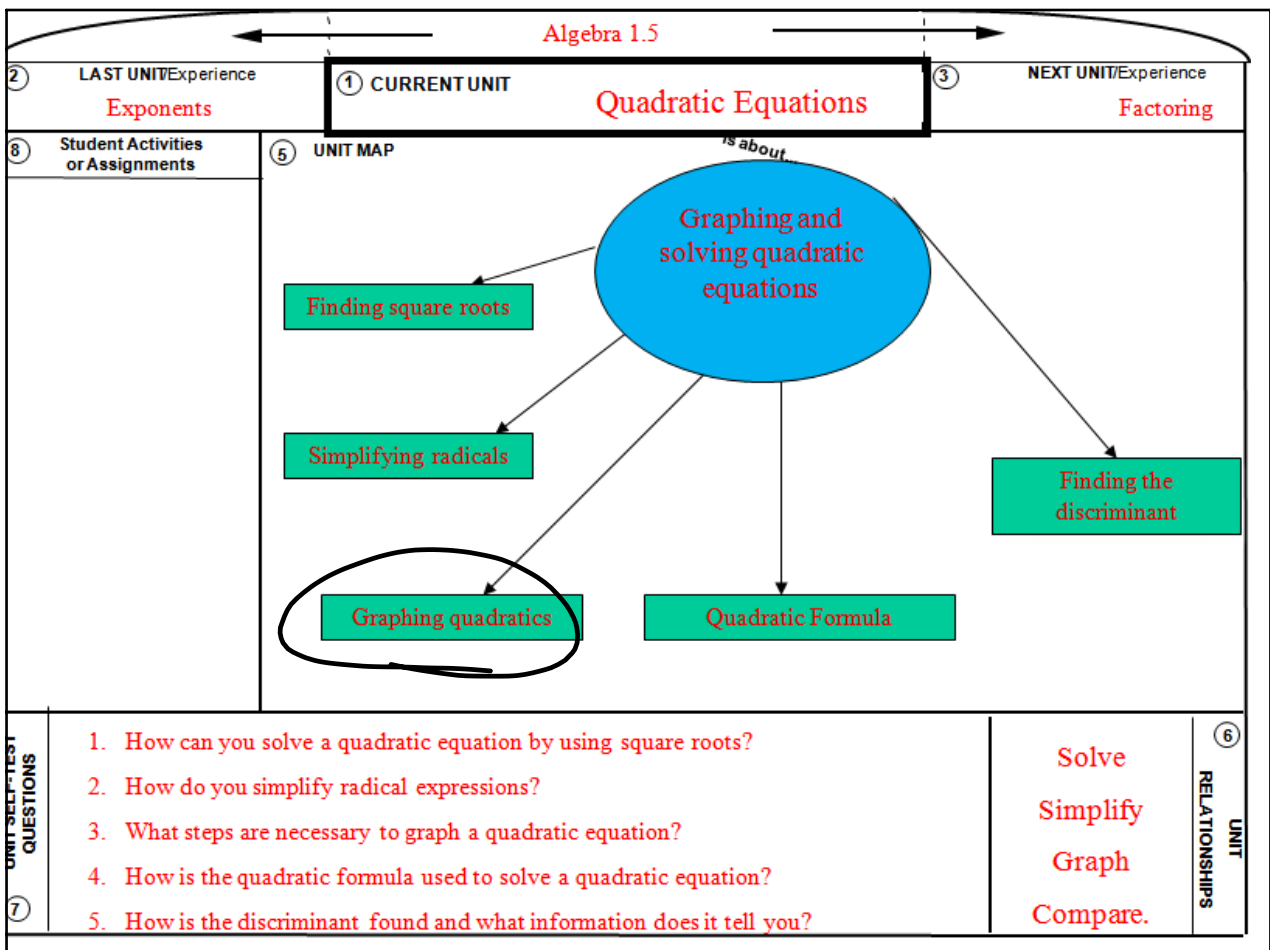
0- I *can't* apply the concepts even with help.

Quadratic Functions and Equations

9.5 Solving Quadratic Equations by Graphing

- Goals:**
- Use a graph to find or check a solution of a quadratic equation.

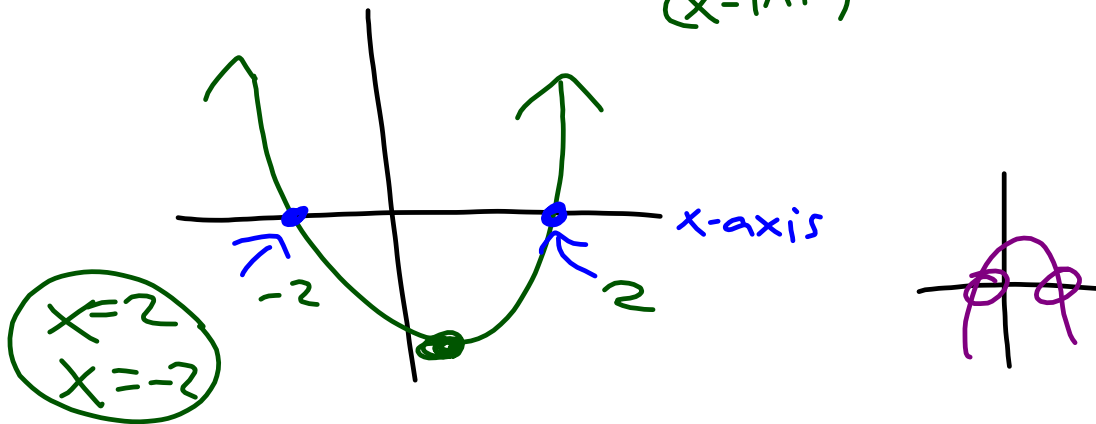
EQ: What is the standard equation?



Vocabulary

Roots of a quadratic equation:

Solutions = roots = x-intercepts of the graph
(x-int)



ESTIMATING SOLUTIONS BY GRAPHING

The solutions of a quadratic equation in one variable x can be estimated by graphing. Use the following steps: (Standard Form)

Step 1 Write the equation in the form $ax^2 + bx + c = 0$

Step 2 Sketch the graph of the related quadratic function

$y = ax^2 + bx + c$ (find vertex & table of pts)

Step 3 Estimate the values of the x-intercepts if any.

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

(where graph cross x-axis)

Example 1: Use a Graph to Solve an Equation

Use the graph of $y = \frac{1}{4}x^2 - 9$ to estimate the solutions of $\frac{1}{4}x^2 - 9 = 0$. Check the solutions algebraically.

$$x = -6 \text{ and } x = 6$$

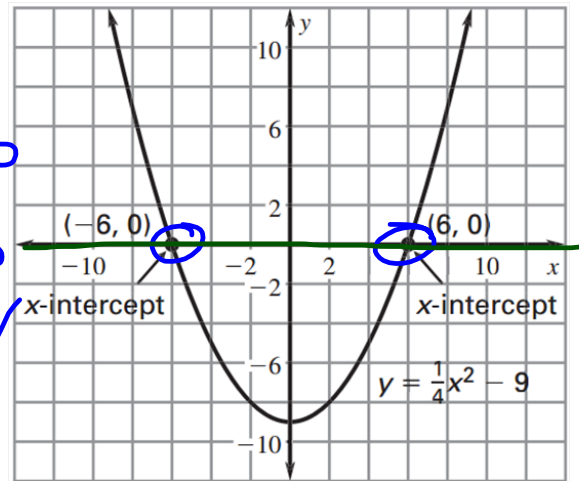
$$\frac{1}{4}(-6)^2 - 9 = 0 \quad \frac{1}{4}(6)^2 - 9 = 0$$

$$\frac{1}{4}(36) - 9 = 0$$

$$0 = 0 \checkmark$$

$$\frac{1}{4}(36) - 9 = 0$$

$$0 = 0 \checkmark$$

**Try It**

- 1) The graph of $y = x^2 - 3x$ is shown at the right. Use the graph to estimate the solutions of $x^2 - 3x = 0$. Check your solutions algebraically.

$$x = 0 \text{ and } x = 3$$

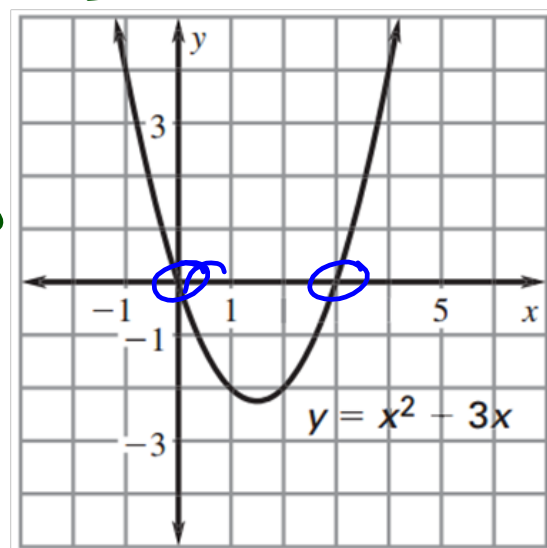
$$0^2 - 3(0) = 0$$

$$0 = 0 \checkmark$$

$$3^2 - 3(3) = 0$$

$$9 - 9 = 0$$

$$0 = 0 \checkmark$$



Example 2: Solve an Equation by Graphing

Use a graph to estimate the solutions of $x^2 + 2x = 3$.
 Check your solutions algebraically. $ax^2 + bx + c = 0$

$x^2 + 2x = 3$
 $-3 \quad -3$
 $x^2 + 2x - 3 = 0$

$a = 1$
 $b = 2$
 $c = -3$

$X = \frac{-b}{2a} = \frac{-2}{2(1)} = -1$
 $y = (-1)^2 + 2(-1) - 3 = 1 - 2 - 3 = -4$
 vertex $(-1, -4)$
 $y = x^2 + 2x - 3$

4	-3	-2	-1	0	1	2
S	0	-3	-4	-3	0	5

$x^2 + 2x = 3$
 $x = -3$
 $(-3)^2 + 2(-3) = 3$
 $3 = 3 \checkmark$

$x = 1$
 $1^2 + 2(1) = 3$
 $3 = 3 \checkmark$

$x = -3, x = 1$
 x -int.
 $(-3, 0), (1, 0)$

Try It Use a graph to estimate the solutions of the equation.
 Check your solutions algebraically.

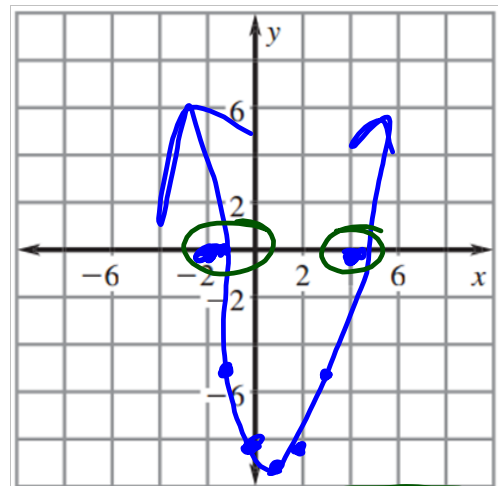
2) $x^2 - 2x = 8$
 $-8 \quad -8$

$x^2 - 2x - 8 = 0$
 $a = 1$
 $b = -2$
 $c = -8$

$x = \frac{-b}{2a} = \frac{2}{2(1)} = 1$
 $x = 1$

$y = 1^2 - 2(1) - 8 = 1 - 2 - 8 = -9$
 $y = -9$
 $y = x^2 - 2x - 8$

-2	-1	0	1	2	3	4
0	-5	-8	-9	-8	-5	0



$x = -2$ and $x = 4$

$(-2)^2 - 2(-2) - 8 = 4 + 4 - 8 = 0$
 $0 = 0 \checkmark$

$4^2 - 2(4) - 8 = 16 - 8 - 8 = 0$
 $0 = 0 \checkmark$

9.4 Practice A

wkst #1-18