Finding the Line of Symmetry:

$y = ax^2 + bx + c$

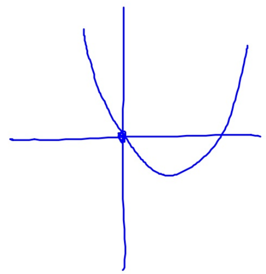
LOS: $x = \frac{-b}{2a}$

"opposite of b divided by $2a$"

When a quadratic is in Standard Form: $y = ax^2 + bx + c$

the y-intercept is always the constant (c).

If the y-int of a parabola is 0 find an x-int.



Ways to find x-intercepts of a quadratic function (solving the equation when y=0):

- Factoring
- Graphing
- Square Roots
- Quadratic Formula

Finding the x-intercepts by factoring:
(solving for x when y=0)

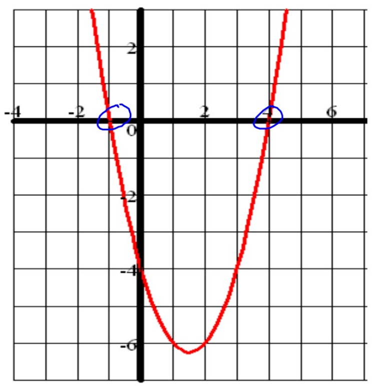
1. Replace y with zero
2. Factor the other side
3. Find the zeros of each factor

Use the graph below to solve this equation:

$x^2 - 3x - 4 = 0$

x = $-1, 4$

they are the x-intercepts of the graph.



Now factor the quadratic:

$(x - 4)(x + 1)$

What are the zeros of the factors?

$x = 4, -1$

Solve by factoring:

$2x^2 - x - 28 = 0$

-56, $+7$, -8, -1

	x	-4
$2x$	$2x^2$	$-8x$
$+7$	$+7x$	-28

$(x-4)(2x+7)=0$

$x = 4, -7/2$

How do these solutions relate to the graph of $y = 2x^2 - x - 28$?

They are the x-intercepts of the graph

Another technique to solve quadratic equations that can be used SOMETIMES is using Square Roots

Ex: Solve using square roots by
1. get x^2 by itself
2. take the square root of both sides

Solve $3x^2 - 12 = 0$

$\sqrt{x^2} = \sqrt{4}$

$x = \pm 2$

Factor $0 = 3x^2 - 12$

$0 = 3(x^2 - 4)$

$0 = 3(x + 2)(x - 2)$

Find the zeros of each factor.

$x = -2, 2$

You can only solve a quadratic equation using SQUARE ROOTS if b = 0

there is no x term

Solve each quadratic equation using square roots.

1. $x^2 - 64 = 0$

   $+64 \quad +64$

   $\sqrt{x^2} = \sqrt{64}$

   $x = \pm 8$

2. $4x^2 - 25 = 0$

   $\frac{4x^2}{4} = \frac{25}{4}$

   $\sqrt{x^2} = \sqrt{\frac{25}{4}}$

   $x = \pm \frac{5}{2}$

3. $18x^2 - 98 = 0$

   $\sqrt{x^2} = \frac{98}{18} = \sqrt{\frac{49}{9}}$

   $x = \pm 7/3$

Radical symbol

$\sqrt[2]{}$ sq root

index

$\sqrt[3]{}$ cube root

$\sqrt[4]{}$ 4th root

Simplifying Square Roots

simplify each.

1. $\sqrt{49} = 7$

2. $\sqrt{100} = 10$

3. $\sqrt{169} = 13$

4. $\sqrt{324} = 18$

Not all numbers are perfect squares.

How would you simplify $\sqrt{75}$ without rounding?

$\sqrt{25 \cdot 3}$

$\sqrt{25} \cdot \sqrt{3}$

$5\sqrt{3}$

Perfect Squares:

4
9
16
25
36
49
64
81
100

$\sqrt{75} = 5\sqrt{3}$

This is called the Exact value since it isn't rounded.
It's in simplified radical form.

Simplify each.

1. $\sqrt{54} = \sqrt{9 \cdot 6}$

   $3\sqrt{6}$

2. $\sqrt{32}$

3. $\sqrt{128}$

4. $\sqrt{147}$