

Unit 3 ... Solving Quadratic Functions

Thursday: Activity Lesson Opener

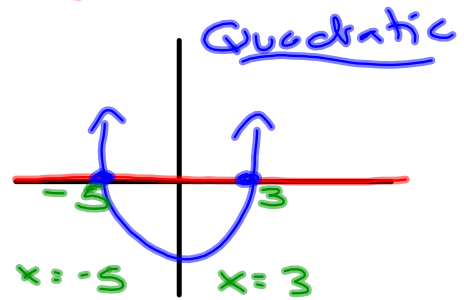
Friday: Notes & Guided Classwork

Monday: Activity , Notes, Guided Practice

Tuesday - Thursday ... depends on the needs of the class

- ★ What is an x-intercept?
 - pt. on x-axis
 - where the graph crosses the x-axis

★ Show a picture of a function with two x-intercepts?



zeros
x-int
solution
Roots

★ Using x-intercepts to find function

$$y = (x + 5)(x - 3) \text{ FACTOR}$$

"FOIL"

$$y = x^2 - 3x + 5x - 15$$

$$y = x^2 + 2x - 15$$

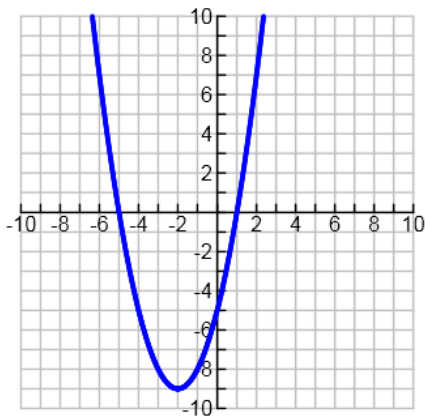
	x	$+3$
x	x^2	$5x$
-3	$-3x$	-15

$$x^2 + 2x - 15$$

Pass out worksheets...

- Write the equation of each quadratic function graphed by their x-intercepts
- What can you explain about the equations you just wrote?
- Now, find the x-intercepts of $y = x^2 + 3x + 2$

Solving Quadratics - D1.notebook



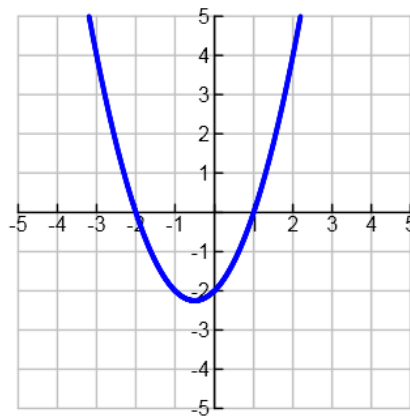
List the x-intercepts: _____ and _____

Write the x-intercepts as factors _____ and _____

FOIL the factors above:

$$(x+5)(x-1)$$

$$x^2 + 4x - 5$$



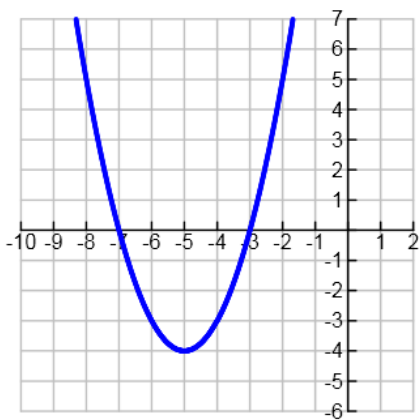
List the x-intercepts: -2 and 1

Write the x-intercepts as factors _____ and _____

FOIL the factors above:

$$(x+2)(x-1)$$

$$x^2 + x - 2$$



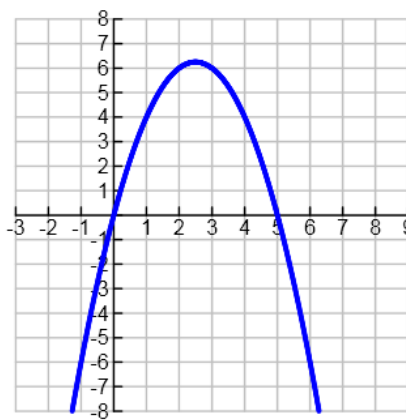
List the x-intercepts: _____ and _____

Write the x-intercepts as factors _____ and _____

FOIL the factors above:

$$(x+7)(x+3)$$

$$x^2 + 10x + 21$$



List the x-intercepts: 0 and 5

Write the x-intercepts as factors (x-0) and (x-5)

FOIL the factors above:

$$y = x^2 - 5x$$

What are x-intercepts?

$$0 = (x+2)(x-1)$$

$$y = (x+2)(x-1)$$

$$x = -2 \quad x = 1 \quad \left\{ \begin{array}{l} \text{x-int} \end{array} \right.$$

$$y = 0 \quad y = 0$$



x-intercepts are roots

x-intercepts are zeros

x-intercepts are solutions

FACTORS :

How do you factor?

$$\begin{array}{l} y = x^2 + 7x + 12 \\ \hline y = (x \quad)(x \quad) \\ \hline \end{array}$$



What do factors tell you about a quadratic function?

How do you factor?

$$y = x^2 + 7x + 12$$

$$y = (x \quad)(x \quad)$$

$$y = x^2 + 7x + 12$$

13 = 1 + 12 1 · 12 = 12

8 = 2 + 6 2 · 6 = 12

7 = 3 + 4 3 · 4 = 12

use 3 and 4

$$(x + 3)(x + 4)$$

$$y = x^2 + 7x + 12$$

FACTOR
1 · 12
2 · 6
3 · 4



$$(x + 3)(x + 4)$$

ADD to.

FACTORS:

* $\sqrt{48}$

24

- 1 · 24 - 1 · -24
 - 2 · 12 - 2 · -12
 - 3 · 8 - 3 · -8
 - 4 · 6 - 4 · -6
 - 6 · 4
- Repeats
* Stop!!

12

- 1 · 12
 - 2 · 6
 - 3 · 4
-
- 1 · -12
 - 2 · -6
 - 3 · -4

18

- 1 · 18
 - 2 · 9
 - 3 · 6
-
- 1 · -18
 - 2 · -9
 - 3 · -6

48

Stop

48

- 1. 48
- 2. 24
- 3. 16 *
- 4. 12
- 6. 8

$$\begin{array}{c} \sqrt{48} \\ / \quad \backslash \\ \sqrt{16} \quad \sqrt{3} \\ 4\sqrt{3} \end{array}$$

Mathematical Way to Factor

Graphical Way to Factor

Any additional ways you have been taught

$$y = x^2 + 3x + 2$$
$$(x+2)(x+1)$$

* x-int.
 $x = -2$

$x = -1$

vertex: $(-\frac{3}{2}, y)$

$$y = x^2 + 9x + 18$$
$$(x+6)(x+3)$$

Practice factoring the following functions

Factor each completely.

$$*1) \frac{4k^2}{4} + \frac{16k}{4} - \frac{128}{4}$$

$$4(k^2 + 4k - 32)$$

$$2) n^2 + 4n - 60$$

$$*3) 2n^2 - 36n + 160$$

$$4(x+8)(x-4)$$

$$4) b^2 + 12b + 35$$

$$5) r^2 + 4r$$

$$8 \cdot 4 = 32$$

$$6) 3x^2 - 15x + 12$$

$$-8 \cdot 4 = -32$$

$$-8 + 4 = -4$$

$$7) x^2 - 14x + 45$$

$$-4 \cdot 8 = -32$$

$$8) r^2 + 7r - 18$$

$$-4 + 8 = +4$$

$$9) m^2 + 16m + 60$$

$$10) v^2 - 6v - 16$$

Answers

1) $4(k-4)(k+8)$

5) $r(r+4)$

9) $(m+6)(m+10)$

2) $(n+10)(n-6)$

6) $3(x-1)(x-4)$

10) $(v+2)(v-8)$

3) $2(n-8)(n-10)$

7) $(x-9)(x-5)$

4) $(b+7)(b+5)$

8) $(r+9)(r-2)$

