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8 Algebra CC Zoom #4 – Unit 15

GRAPHING QUADRATIC FUNCTIONS

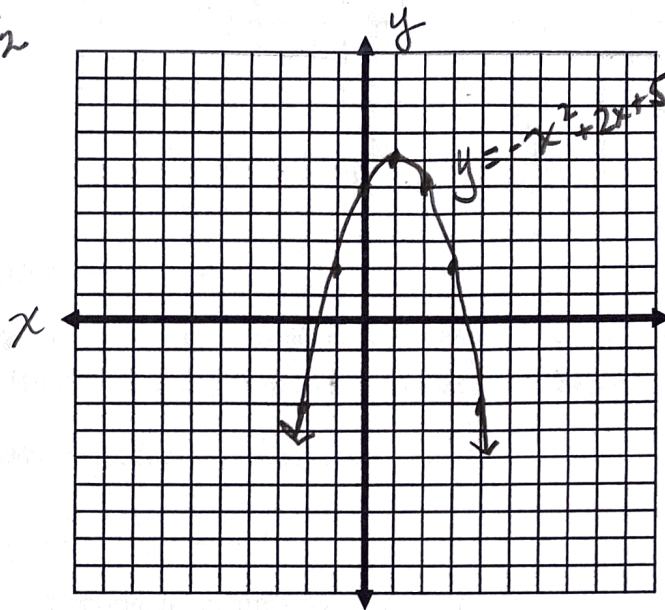
Reminders:

- Find the **x**-coordinate of the **vertex** (turning point) using the formula, $x = \frac{-b}{2a}$
- Create a **table of values** using three **x**-values smaller than the vertex, and three **x**-values larger than the vertex.

1. $y = -x^2 + 2x + 5$

$a = -1$
 $b = 2$

x	y
-2	-3
-1	2
0	5
1	6
2	5
3	2
4	-3



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

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

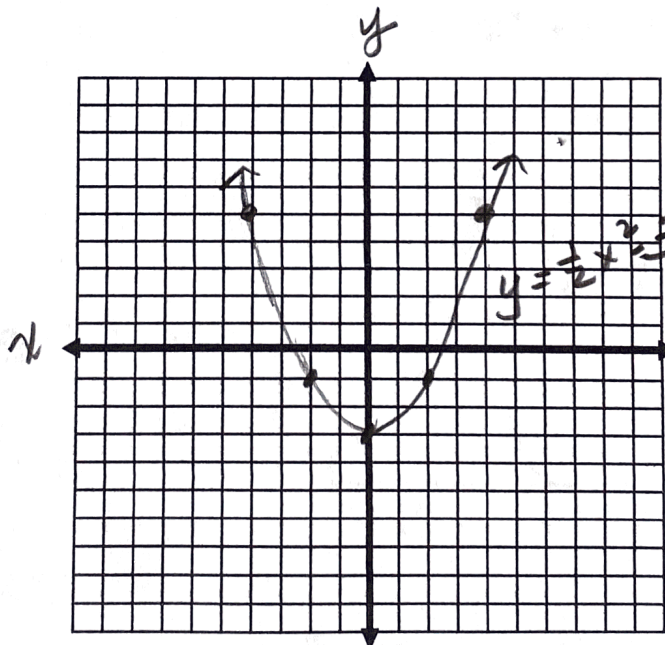
$$\frac{-2}{-2}$$

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

$a = \frac{1}{2}$
 $b = 0$

$-\frac{1}{2}x^2 + 0x - 3$

x	y
-4	5
-3	1.5
-2	-1
-1	-2.5
0	-3
1	-2.5
2	-1
3	1.5
4	5



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

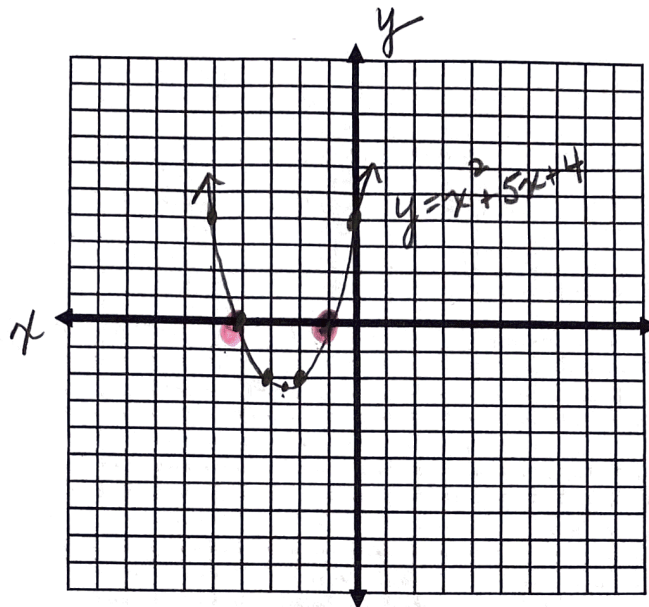
$$x = \frac{-0}{2(\frac{1}{2})} = 0$$

3. $y = x^2 + 5x + 4$

$a=1$ ☺

x	y
-5	4
-4	0
-3	-2
-2.5	-2.25
-2	-2
-1	0
0	4

Vertex



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

$$x = \frac{-5}{2(1)} = -2.5$$

THE ROOTS OF A QUADRATIC FUNCTION

The "roots" of a parabola are the **x-coordinates** of the points where the curve intercepts the x-axis. These values are also known as the "zeros" of the function.

A. Identify the **x-intercepts** of the function in example # 3.

x-intercepts: $(-4, 0)$ $(-1, 0)$

B. Identify the **roots** of the function in example #3.

$$x = \{-4, -1\}$$

C. How can we determine the roots *algebraically*?

$$y = x^2 + 5x + 4$$

$$0 = x^2 + 5x + 4$$

$$0 = (x+4)(x+1)$$

$x+4=0$	$x+1=0$
$-4-4$	$-1-1$
$x=-4$	$x=-1$

$$x = \{-4, -1\}$$

D. Identify the **roots** (zeros) of the function.

