

What's Going On?

Checking In

F.F.M.

Minds on

The Features of a Parabola

Action!

Investigation

Consolidation

Graphing

Learning Goal - I will be able to determine the zeros, axis of symmetry and y-intercept of a factored form quadratic.

| Checking In

F.F.M.

Convert the factored form equation below into standard form.

Nov. 28

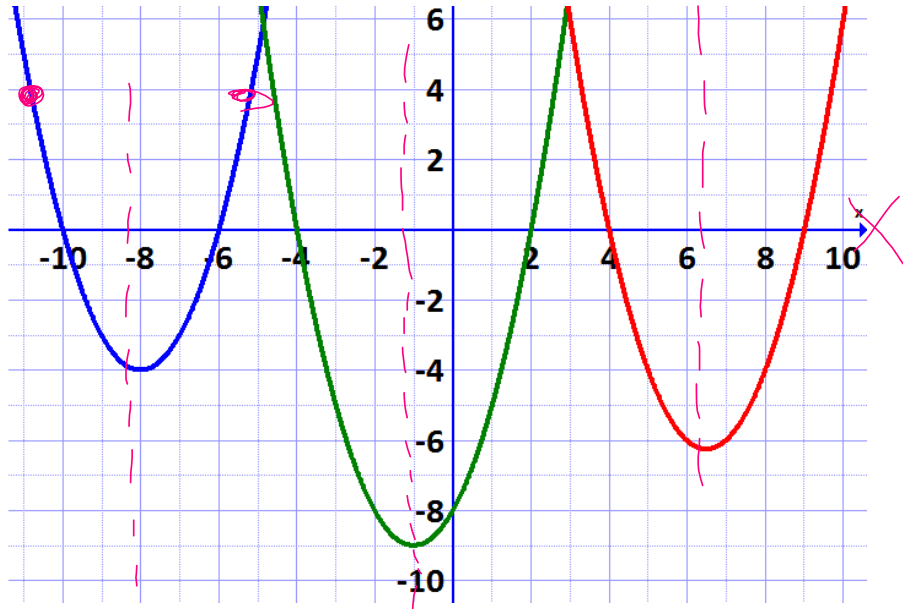
$$y = (x - 5)(x + 4)$$

A handwritten diagram illustrating the FOIL method for multiplying the factored form equation $y = (x - 5)(x + 4)$. The diagram consists of a grid with a vertical line separating the two binomials. The top row contains x and -5 , and the bottom row contains x and $+4$. The products are written in the cells: x^2 (top-left), $-5x$ (top-right), x^2 (bottom-left), and $+20$ (bottom-right). A large red circle encloses the entire grid. To the right of the grid, the terms $-1x$ and -20 are written, indicating the simplification of the expression. Below the grid, the final standard form equation $y = x^2 - 1x - 20$ is written in red.

$$y = x^2 - 1x - 20$$

Minds on

The Features of a Parabola



Zeros/x-intercepts

-10, -6

Axis of Symmetry

$$x = -8$$

$$\frac{-10 - 6}{2}$$

$$\frac{-16}{2} = -8$$

Zeros/x-intercepts

-4, 2

Axis of Symmetry

$$x = -1$$

$$\frac{-4 + 2}{2}$$

$$\frac{-2}{2} = -1$$

Zeros/x-intercepts

4, 9

Axis of Symmetry

$$x = 6.5$$

$$\frac{4 + 9}{2}$$

$$\frac{13}{2} = 6.5$$

Minds on

The Features of a Parabola

If we know the zeros of a parabola, how can we find the axis of symmetry?

Add up the zeros and divide by 2.
(Take the average of the zeros)
The axis of symmetry is halfway between the zeros.

Action!

Investigation

Move around the room and collect your data!

Feel free to use a clipboard while supplies last.

Quadratic Relations: Day 3 – Finding x-Intercepts and y-intercepts

Move around the room and fill in this table using the blue and green parabolas that you posted on Monday.

Factored Form Equation $y = a(x+r)(x+s)$	Standard Form Equation $y = ax^2 + bx + c$	r	s	c	Zeros / x-Intercepts	y-Intercept
$y = (x-3)(x-2)$	$y = x^2 - 5x + 6$	3	2	6	2, 3	6
$y = (x+2)(x+3)$	$y = x^2 + 5x + 6$	-2	-3	6	-2, -3	6
$y = (x-1)(x-3)$	$y = x^2 - 4x + 3$	1	3	3	1, 3	3
$y = (x+1)(x+3)$	$y = x^2 + 4x + 3$	-1	-3	3	-1, -3	3
$y = (x+2)(x+4)$	$y = x^2 + 6x + 8$	-2	-4	8	-4, -2	8
$y = (x+2)(x+1)$	$y = x^2 + 3x + 2$	-2	-1	2	-1, -2	2
$y = (x-1)(x-2)$	$y = x^2 - 3x + 2$	1	2	2	1, 2	2
$y = (x+1)(x-2)$	$y = x^2 - x - 2$	-1	2	-2	-1, 2	-2
$y = (x-2)(x-4)$	$y = x^2 - 6x + 8$	2	4	8	2, 4	8
$y = (x+2)(x-4)$	$y = x^2 - 2x - 8$	-2	4	-8	-2, 4	-8

How can you determine the zeros / x-intercepts of a parabola from its factored form equation?

$$y = (x - 3)(x - 4) \quad y = (x + 2)(x - 5)$$

$+3$ $+4$
 -2 $+5$

To find the zeros, change the sign on each number.

How can you determine the y-intercept of a parabola from its standard form equation?

The y-intercept is c!

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

$$y = x^2 + 6x - 7$$

How can you determine the y-intercept of a parabola from its factored form equation?

$$y = (x - 2)(x + 3) \quad y = -(x + 1)(x + 5)$$

\times
 \times

Multiply the two numbers together.

Consolidation

Graphing

How can we graph a parabola given its factored form equation?

1. Plot the zeros.
2. Determine the axis of symmetry by adding the zeros together and then dividing by 2.
3. Draw the axis of symmetry on your graph.
4. Determine the y-intercept by multiplying the zeros together.
5. Plot the y-intercept on your graph.
6. Plot one additional point by "reflecting" the y-intercept across the axis of symmetry.