

Quadratics Review

Forms of A Quadratic - Standard Form: $y = ax^2 + bx + c$

- The y-intercept is the last or < term.
- We can change factored into standard form by expanding
- There are two methods of expanding: The Grid and FOIL.

Example 1: Find the y-intercept, x-intercepts of the following quadratic:

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

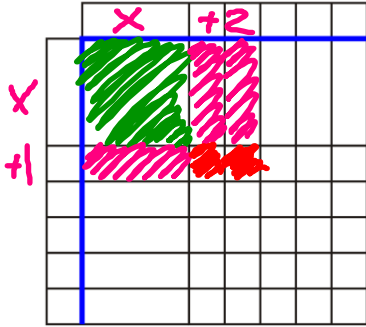
Method 1: Table	Method 2: Algebra - FOIL
$y = \begin{array}{ c c c } \hline & x & +4 \\ \hline x & x^2 & +4x \\ \hline -5 & -5x & -20 \\ \hline \end{array}$ <p style="text-align: center;">$-1x$</p>	$y = (x+4)(x-5)$ $y = x^2 - 5x + 4x - 20$ $y = x^2 - 1x - 20$
$y = x^2 - 1x - 20$	
<p>The y-intercept is: <u>-20</u></p> <p>The x-intercepts are: <u>-4</u> and <u>+5</u></p> $\frac{-4+5}{2} = \frac{1}{2} = 0.5$ <p>The axis of symmetry is: <u>$x = 0.5$</u></p>	

Example 2: Expand the following: $y = 2x(3x - 4)$

$$y = 6x^2 - 8x$$

4. Forms of A Quadratic - Factored Form: $y = (x - r)(x - s)$

- There are two methods of factoring: algebra tiles and algebra
- Example: factor $y = x^2 + 3x + 2$ using tiles



$$y = x^2 + 3x + 2$$

1 big square
3 rectangles
2 little squares

1. Product/Sum Form: Factor $y = ax^2 + bx + c$

- In this case $r \times s = c$ and $r + s = b$
- Find the x-intercepts of the following:

$y = x^2 + 6x + 8$ Two numbers that multiply to 8 and add to 6.
 $2 + 4$
 $y = (x + 2)(x + 4)$

$y = x^2 - 3x - 18$ Two numbers that multiply to -18 and add to -3.
 $3 + -6$
 $y = (x + 3)(x - 6)$

2. Common Factoring: $y = ax^2 + bx$

- Let us factor: $y = x^2 + 3x$

This can be written as: $y = x^2 + 3x + 0$

Based on this $r \times s = 0$

$r + s = 3$

The factored form is $y = (x + 0)(x + 3)$ or $y = x(x + 3)$

- Factor and state the x and y intercepts of:

$y = x^2 + 6x + 0$ $y = (x + 0)(x + 6)$ $y = x(x + 6)$	$y = 2x^2 - 2x - 60$ $y = 2(x^2 - x - 30)$ $y = 2(x - 6)(x + 5)$
--	--

y-int: 0
zeros: -6, 0

3. Difference of Squares: $y = ax^2 - b^2$

- $y = x^2 - 4$ can be written as $y = x^2 + 0x - 4$

$r \times s = -4$

$r + s = 0$ factored form

$y = x^2 - 16$ $y = (x + 4)(x - 4)$	$y = 2x^2 - 200$ $y = 2(x^2 - 100)$ $y = 2(x + 10)(x - 10)$
--	---

y-int = -60
zeros = +6, -5