Algebra 2: Foldable 4.1-4.5:

Requirements:

Standard: Equation form; what "a" tells us; Axis of Symmetry; Vertex

Vertex: Equation form; what "a" tells us; Axis of Symmetry; Vertex

Intercept: Equation form; what "a" tells us; Axis of Symmetry; Vertex; and x-intercepts.

Solve Square Roots (4.5)

Factoring Trinomials

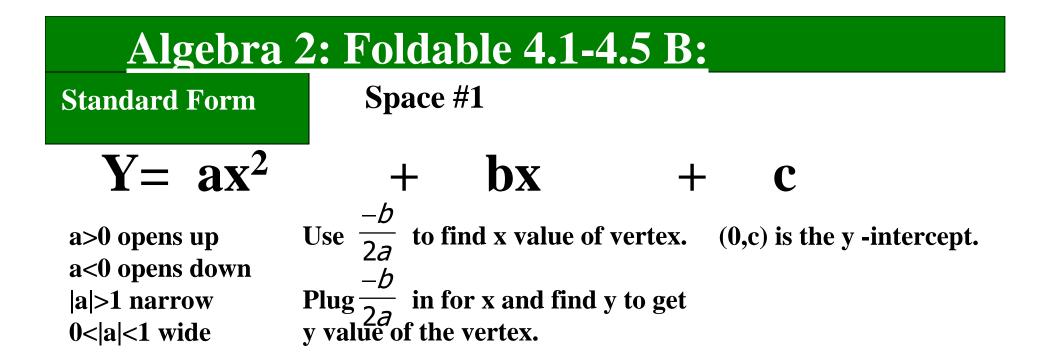
Factoring GCF

Factoring Difference of Squares

Might want to add the following:

Simplifying Square Roots

Solving with Factoring



Space #2

Vertex Form

Y = aa>0 opens up a<0 opens down |a|>1 narrow **0**<|*a*|<1 wide

 $(x - h)^2$ If x-5 then h=+5If x+5 then h=-5Tells how far the vertex moves left or right.

+ k If +6 then k=6 If -6 then k=-6 h is the x value of the vertex. k is the y value of the vertex. Tells how far the vertex moves up or down.

Intercept Form

Y= a a>0 opens up a<0 opens down |a|>1 narrow 0<|a|<1 wide

Space #3

(x - p)(x - q)

(p,0) and (q,0) are the x-intercepts.x-value of the vertex is (p+q)/2y-value of vertex, plug in x and find y.

Remember:

X-value of the vertex tells how far the graph moves left or right. Y-value of the vertex tells how far the graph moves up or down.

Remember:

P and Q give you the zeros when it is in Intercept Form.

Algebra 2: Option put Space #1 thru #3 in 1 space:

Equation Name	<u>Standard</u>	<u>Vertex</u>	<u>Intercept</u>
Equation Form	$y = ax^2 + bx + c$	$y = a(x-h)^2 + k$	y = a(x-p)(x-q) Zeros: $(p, 0) \otimes (q, 0)$
"a" tells what	a > 0 opens up (minimum) $ a > 0$ narrow $ a = 1$ same $a < 0$ opens down (maximum) $0 < a < 1$ wide		
Axis of Symmetry	$x = \frac{-b}{2a}$	x = h	$x = \frac{p+q}{2}$
Vertex F(#) means plug # in for x and simplify to find y.	$\left(\frac{-b}{2a}, F\left(\frac{-b}{2a}\right)\right)$	(h, k)	$\left(\frac{p+q}{2}, F\left(\frac{p+q}{2}\right)\right)$

(4.5) Example 2: Solve with Square Roots. Used to find zeros when Quadratic is in Vertex Form.

Solve:
$$\frac{1}{4}(y-6)^2 = 8$$

 $\frac{4}{1} \cdot \frac{1}{4}(y-6)^2 = 8 \cdot \frac{4}{1}$
 $(y-6)^2 = 32$

Space #4

Step 1: Isolate the squared term.

Solve:
$$(x+3)^2 = 16$$

$$\left(x+3\right)^2 = 16$$

Step 2: Square root both sides.

 $\sqrt{\left(x+3\right)^2} = \pm\sqrt{16}$ $x + 3 = \pm 4$

$$x + 3 = \pm 4$$
$$-3 - 3$$
$$x = -3 \pm 4$$
$$x = -7, 1$$

 $\sqrt{(y-6)^2} = \pm\sqrt{32}$ $y-6 = \pm4\sqrt{2}$ $y-6 = \pm4\sqrt{2}$ +6 + 6 $y = 6 \pm 4\sqrt{2}$

Step 3: Solve for the variable.

Space #5: Summary of Factoring & Difference of Squares Formula:

Summary of Factoring:

- <u>Step 1:</u> If all terms have a greatest common factor other than one, then factor it out.
- **<u>Step 2:</u>** If the polynomial has:
 - Two terms, then try factoring using the difference of squares formula.
 - Three terms, then try the guess and check method.
 - (Four or more terms, then try the factoring by grouping method.)
 - Difference of Squares (only works for something squared minus something squared)
- $a^2-b^2=(a+b)(a-b)$

Space #6: Factor GCF:

Factoring: GCF: The greatest common factor is the largest factor that divides all terms evenly.

- Step 1: determine the GCF and write it down. Then divide each term by the GCF.

$$15x^{2}y + 5xy^{2} - 25x^{3}$$
$$GCF = 5x$$
$$5x\left(\frac{15x^{2}y}{5x} + \frac{5xy^{2}}{5x} - \frac{25x^{3}}{5x}\right)$$

• Step 2: Simplify. Answer: $5x(3xy + y^2 - 5x^2)$

• <u>Step 3:</u> Check the resul by using Distributive Property.

$$15x^{2}y + 5x(y^{2}) - 5x(5x^{2})$$

$$15x^{2}y + 5xy^{2} - 25x^{3} \checkmark$$

$$15x^2y + 5xy^2 - 25x^3$$

Space #7: Pick a Method (Area Method/Guess & Check Method/Table Method) Table Method shown below.

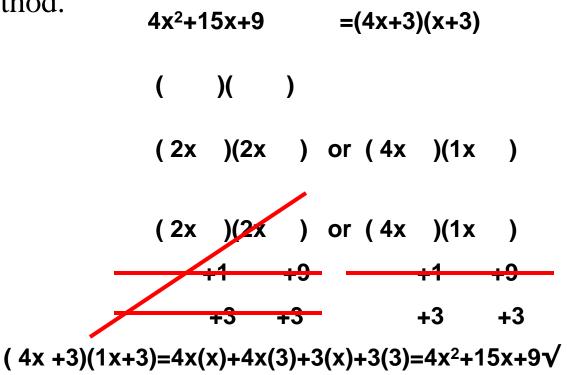
• The Table Method incorporates both the Area Method and the Guess and Check Method.

Step 1: Draw parentheses

Step 2: Fill in the missing factors to get the first term.

Step 3: Fill in the missing factors to get the last term.

Step 4: Check by FOIL, if it doesn't work retry steps 1 and 2.



Space #8: Solve by Factoring: Used to find zeros/roots when the **Quadratic is in Standard From**

- **<u>Step 1:</u>** Factor the polynomial.
- **<u>Step 2</u>**: Set each factor equal to zero and solve.

Example:

$$2x^{2} - x - 21 = 0$$

$$(2x - 7)(x + 3) = 0$$

$$2x - 7 = 0 \qquad x + 3 = 0$$

$$\frac{+7 + 7}{\frac{2x}{2} = \frac{7}{2}} \qquad \frac{-3 - 3}{x = -3}$$

$$x = \frac{7}{2} \quad or \quad x = -3$$