SM3-A HANDOUT 2-5 (Intercept Form Quadratic Equation)

$x^2 + 11x + 30$ → _____

$x^2 - 10x - 24$ → _____

$x^2 - 8x + 15$ → _____

Standard Form Quadratic Equation	***Intercept*** Form Quadratic Equation
$y = ax^2 + bx + c$	$y = a(x - p)(x - q)$
$y = x^2 + 11x + 30$	→
$y = x^2 - 10x - 24$	→
$y = x^2 - 8x + 15$	→

Intercept form Quadratic Equation

$y = (x - 1)(x - 3)$

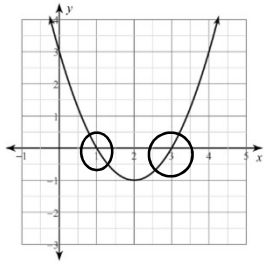
The y-value of an x-intercept always equals _____

$0 = (x - 1)(x - 3)$

$0 = A * B$

Zero Product Property: either _____ = 0 or _____ = 0

x = ____ x = _____



Standard Form Quadratic Equation is converted to an ***Intercept*** Form Quadratic Equation by _____

$y = x^2 + 10x + 21$ → $y =$ _____

x = ____ x = ____

$y = x^2 - 6x - 16$ → $y =$ _____

x = __ x = __

$y = x^2 - 9x + 18$ → $y =$ _____

x = ____ x = ____

What are the x-intercepts for each of these equations?

Convert the following Standard Form Quadratic Equations to Intercept Form (by factoring)

$y = x^2 + 3x - 10$ → $y =$ _____

x = ____ x = ____

$y = x^2 - 8x - 20$ → $y =$ _____

x = __ x = __

$y = x^2 - 11x + 30$ → $y =$ _____

x = ____ x = ____

What are the x-intercepts for each of these equations?

Intercept Form Quadratic Equation:

Vertical Stretch Factor!

'x-intercepts are 'p' and 'q'

$$y = (-1)a(x-p)(x-q)$$

If negative: reflected across x-axis.

$y = -3(x+2)(x+4)$

Opens down

'x-intercepts are: ___ and '___'

'x-intercepts are: '1' and '3'

$y = (x-1)(x-3)$

Each set of parentheses is called a "factor". Why?

Convert to Intercept Form

$y = 2x^2 + 6x + 4$

Always factor out the common factor first.

$y =$ _____

Now factor the trinomial.

$y =$ _____

What are the x-intercepts?

'x-intercepts are: ____' and '____'

Which way (up/down) does the parabola open?

Up (not reflected across x-axis)

What is the vertical stretch factor?

VSF = ____

Convert to Intercept Form

$y = 3x^2 - 15x - 18$

Always factor out the common factor first.

$y =$ _____

Now factor the trinomial.

$y =$ _____

What are the x-intercepts?

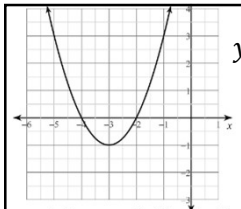
'x-intercepts are: '_____' and '_____'

Which way (up/down) does the parabola open?

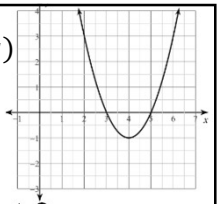
Up (not reflected across x-axis)

What is the vertical stretch factor?

VSF = ___



$y = (-1)a(x-p)(x-q)$



x-intercepts? '-4' and '-2'

x-intercepts? '3' and '5'

How can you use the *x-intercepts* to determine the *x-coordinate* of the vertex?

The *x-coordinate* of the vertex is *halfway* between the x-intercepts

x-coordinate of the vertex?

(____, ___)

x-coordinate of the vertex?

(____, ___)

What is the equation that has been graphed (in *intercept form*)?

$y =$ _____

$y =$ _____

Half-way between two numbers is the average of the two numbers. The x-coordinate of the vertex is exactly half-way between the two x-intercepts.

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

x = -5 x = 1

$x = \frac{-5+1}{2} = \frac{-4}{2}$ = -2

What are the x-intercepts?

What is the x-coordinate of the vertex? (-2, ___)

What is the y-coordinate of the vertex? f(-2)= ?

$f(-2) = (-2+5)(-2-1) = (3)(-3)$

f(-2)= -9

What is the vertical coefficient? $y = a(x-p)(x-q)$

a = 1

What is the vertex form equation? $y = a(x-h)^2 + k$

$y = (x+2)^2 - 9$

$f(x) = 2(x-6)(x-4)$

What are the x-intercepts? x = ___ x = ___

What is the x-coordinate of the vertex? $x = \frac{\_\_ + \_\_}{2}$ = ___

(____,___)

What is the y-coordinate of the vertex? f(___) = ?

$f(\_) = (\_\_ - 6)(\_ - 4)$

Vertex: (___,___)

What is the coefficient? a = ___

What is the vertex form equation? $y = a(x-h)^2 + k$

$y =$ _____

What is the vertex?

$y = 2(x+2)(x-4)$

x = -2 x = 4

$x = \frac{-2+4}{2} = \frac{2}{2}$ = 1

(1, ___)

$y = 2(1+2)(1-4)$ $y = 2(3)(-3)$ $y = -18$

(1, -18)

What is the vertex form equation? $y = a(x-h)^2 + k$

$y = 2(x-1)^2 - 18$

What is the standard form equation?

$y = 2(x+2)(x-4)$

(Distributive Property)

$y = (2x+4)(x-4)$

	x	-4
2x	$2x^2$	-8x
4	4x	-16

$y = ax^2 + bx + c$

$y = 2x^2 - 4x - 16$

What is the vertex form equation?

$y = 3(x+1)(x-5)$

$y =$ _____

What is the standard form equation?

$y = 3(x+1)(x-5)$

(Distributive Property)

$y =$ _____

$y = ax^2 + bx + c$

$y =$ _____

What is the vertex form equation?

$y = (x - 8)(x - 2)$

$y =$ _____

What is the standard form equation?

$y = (x - 8)(x - 2)$

(Distributive Property)

$y =$ _____

$y = ax^2 + bx + c$

$y =$ _____

What is the intercept form equation?

$y = -3x^2 + 6x + 72$

Common factor? $y =$ ___(_____)

Factor trinomial? $y =$ _____

What are the x-intercepts? x = _____ x = _____

What is the vertex form equation?

$y =$ _____