SM2 HANDOUT 5-2 (Intercept Form Quadratic Equation)

$x^2 + 11x + 30$ →

$x^2 - 10x - 24$ →

$x^2 - 8x + 15$ →

Standard Form Quadratic Equation

$y = ax^2 + bx + c$

$y = x^2 + 11x + 30$

$y = x^2 - 10x - 24$

$y = x^2 - 8x + 15$

Intercept **Form Quadratic Equation**

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

$y = x^2 + 11x + 30$ →

$y = x^2 - 10x - 24$ →

$y = x^2 - 8x + 15$ →

Intercept form Quadratic Equation

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

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

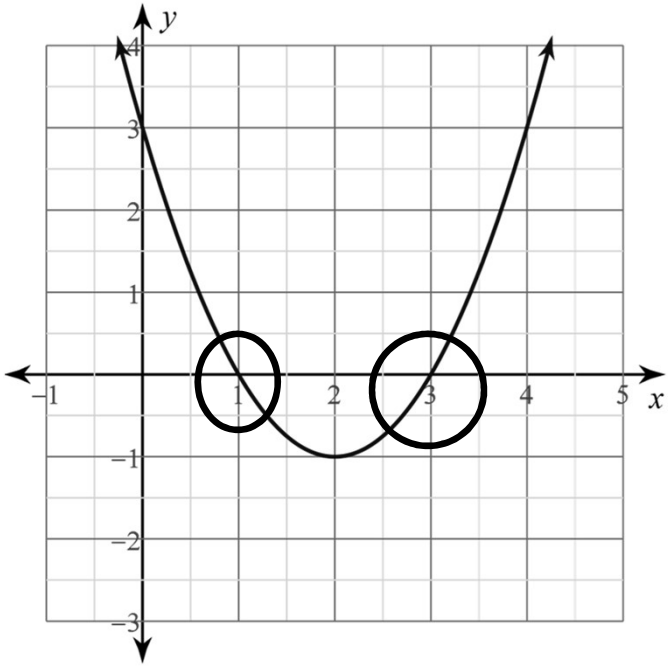
$$0 = (x - 1)(x - 3)$$

$$0 = A * B$$

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 = ____

$y = x^2 - 8x - 20$ → $y =$ _____

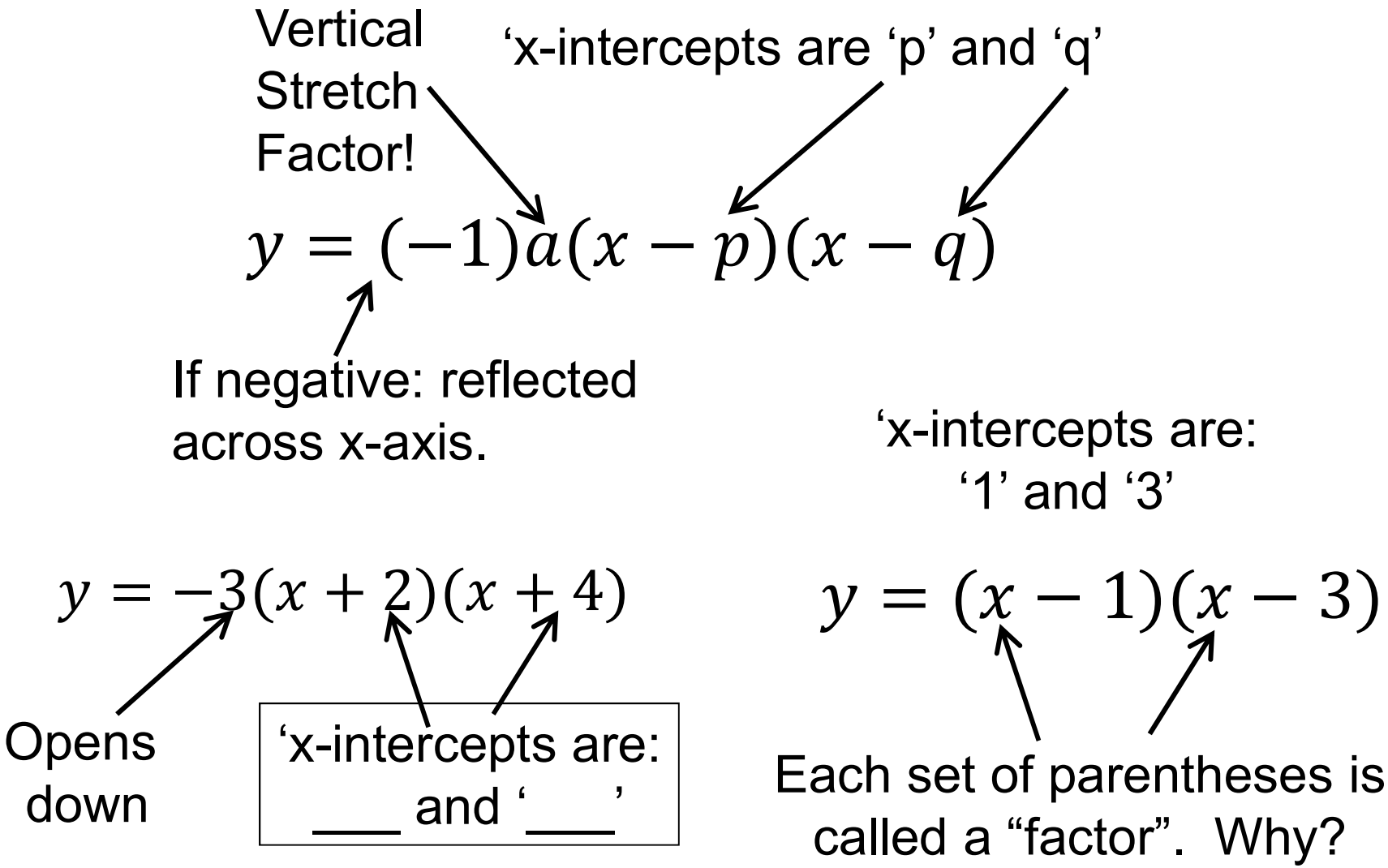
x = ___ x = ___

$y = x^2 - 11x + 30$ → $y =$ _____

x = ____ x = ____

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

Intercept Form Quadratic Equation:



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?

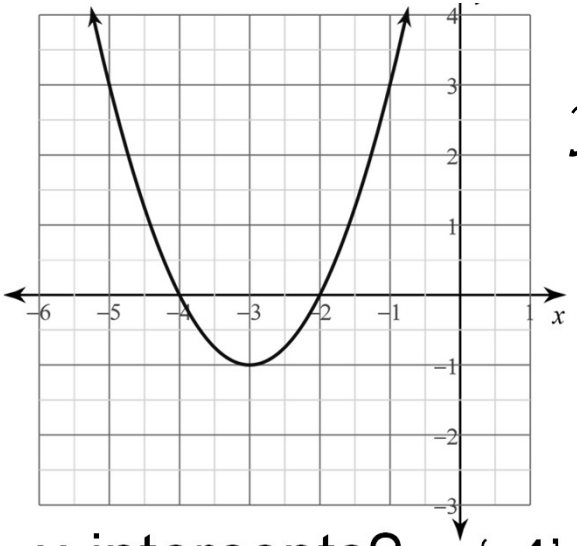
'x-intercepts are: '_____' and '_____'

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

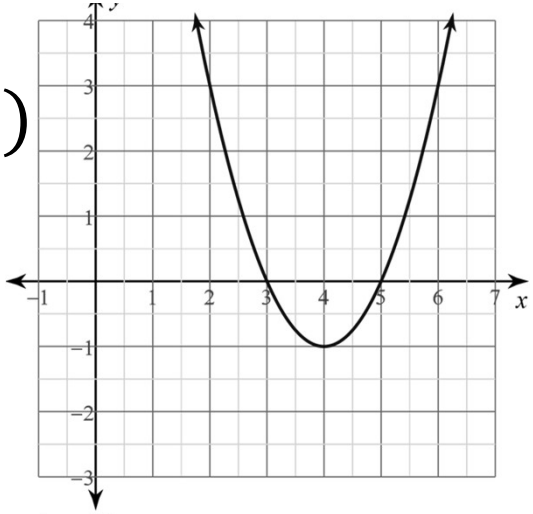
Up (not reflected across x-axis)

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(____) = ?

$f(\_\_) = 2(\_\_ - 6)(\_ - 4)$

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

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

(1, ____)

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

(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?

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

$y =$ _____

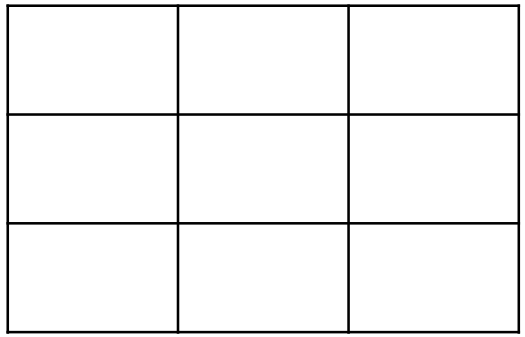
What is the standard form equation?

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

(Distributive Property)

$y =$ _____

$y = ax^2 + bx + c$



$y =$ _____

What is the vertex form equation?

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

$y =$ _____

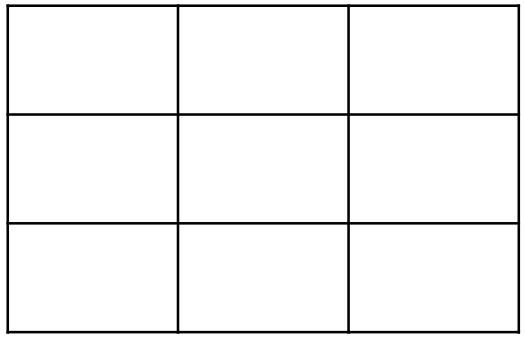
What is the standard form equation?

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

(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?

$y = \_\_\_\_\_$