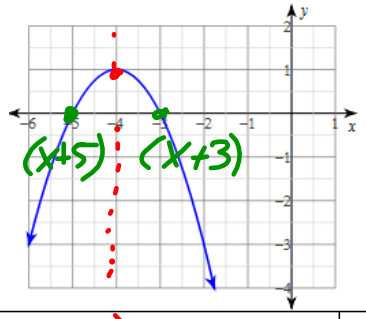
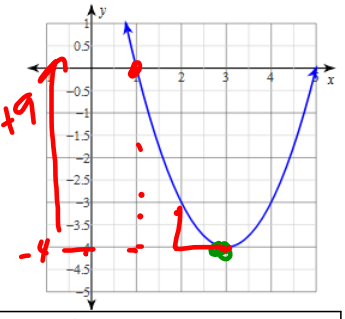
WARM-UP

Complete the following table based on the two graphs.





vertex:	(-4, 1)	(3, -4)
AoS:	x = -4	x = 3
x-int:	(-5, 0) (-3, 0)	1, 5
y-int:	$-(0+4)^2+1 = -15$	$9-4 = 5$
stretch:	-1	1, normal
max or min:	max @ (-4, 1)	min @ -4
equation in vertex form:	$-(x+4)^2+1$	$1(x-3)^2-4$
equation in intercept form:	$-(x+5)(x+3)$	$1(x-1)(x-5)$

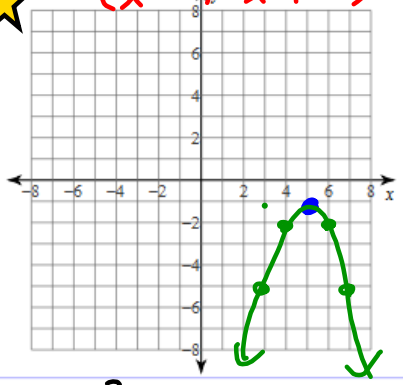
$(-1)(-5) = 5$

Nov 13-7:11 AM

3) $y = -x^2 + 10x - 26$

$-(x^2 - 10x + 26)$

26 CAN'T -10



EXTRA EXAMPLES

back of yellow packet

$-x^2 + 10 - 26$

$-(x^2 - 10x + 25) - 26 + 25$

25

$-(x-5)^2 - 1$

(5, -1)

Nov 19-7:22 AM

4) $x^2+10x+23 = -2$

$x^2+10x+23=-2$
$+2 \quad +2$
$x^2+10x+25=0$
$5 \quad 5$
$(x+5)(x+5)=0$

16) $y = 2x^2 + 16x + 41$

2.41
82
CAN'T
16

$2(x^2+8x+16) +41-32$
$x+4$
32
$16 \quad 16$
$2(x+4)^2+9$

EXTRA EXAMPLES

back of yellow packet

Nov 19-7:26 AM

33) $20n^2 - 42n + 18$

$2(10n^2-21n+9)$
$2(5n-3)(2n-3)$

-21
$-15 \quad -6$
90

	$5n$	-3
$2n$	$10n^2$	$-6n$
-3	$-15n$	9

AMIB

34) $50v^2 + 35v - 30$

$5(10v^2+7v-6)$
$5(2v-1)(5v+6)$

7
$12 \quad -5$
-60

	$2v$	-1
$5v$	$10v^2$	$-5v$
6	$12v$	-6

EXTRA EXAMPLES

back of yellow packet

Nov 19-7:31 AM

Helpful Quadratic Hints

Factored Form: $f(x) = a(x - p)(x - q)$

Vertex: x coordinate is halfway between the x intercepts, substitute back into function to find y-value.

x-intercepts: opposite value in the two parentheses (p, 0) and (q, 0)

y-intercept: a(p)(q). C is the y-intercept sub $x = 0$

Stretch: a a whole number makes parabola skinnier, fraction makes it wider.

Example: $f(x) = (x+ 3)(x - 1)$

Vertex: $(-1, -4)$

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

$(2)(-2)$

$y = -4$

x-intercepts: $(-3, 0)$ $(1, 0)$

$-3, 1$

-1 $4/2$

y-intercepts: $y = (0+3)(0-1)$

$(3)(-1) = -3$

Nov 13-7:30 AM

Find the vertex, the stretch, the axis of symmetry, the x-intercept, the y-intercept, and the direction the parabola opens for each of the following.

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

vertex: $(3, 1)$ $\rightarrow (x-3)^2 + 1$

stretch: -1 $-(3-4)(3-2) = -(-1)(1) = 1$

AoS: 3

x-ints: $4, 2$

y-int: $-(-4)(-2) = -8$

open: down

Nov 13-7:32 AM

Find the vertex, the stretch, the axis of symmetry, the x-intercept, the y-intercept, and the direction the parabola opens for each of the following.

2) $y = 2(x+5)(x+3)$

vertex: $(-4,-2)$ $y = 2(-4+5)(-4+3)$ $2(1)(-1) = -2$

stretch: 2

AoS: $x = -4$

x-ints: -5 and -3 $(-5,0)$ $(-3,0)$

y-int: $2(5)(3) = 30$

open: up

Nov 13-7:32 AM

Find the vertex, the stretch, the axis of symmetry, the x-intercept, the y-intercept, and the direction the parabola opens for each of the following.

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

vertex:

stretch:

AoS:

x-ints:

y-int:

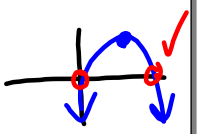
open:

Nov 13-7:32 AM

Vertex Form: $f(x) = a(x-h)^2 + k$

Vertex: (h, k)

x-intercepts: set y = 0 and solve for x does it touch? check if x-intercepts exist!?



y-intercept: set x = 0 and solve for y. C is the y-intercept.

Stretch: a. a whole number makes parabola skinnier, fraction makes it wider.

Example: $f(x) = -2(x-3)^2 + 4$ (right, up)

Vertex: $(3, 4)$

Idea: $2^2 = 4$, $(-2)^2 = 4$, $-2, 2 = \pm\sqrt{4}$

x-intercepts:

$0 = -2(x-3)^2 + 4$

$-4 = -2(x-3)^2$

$\frac{-4}{-2} = \frac{-2(x-3)^2}{-2}$

$\pm\sqrt{2} = \sqrt{(x-3)^2}$

$3 \pm \sqrt{2} = x - 3$

$x = 3 + \sqrt{2}, 3 - \sqrt{2}$

$x = 4.4142, 1.5857$

y-intercept: sub $x = 0$

$y = -2(0-3)^2 + 4$

$-2(9) + 4$

$-18 + 4$

$y = -14$

Nov 13-7:35 AM

Find the vertex, the stretch, the axis of symmetry, the x-intercept, the y-intercept, and the direction the parabola opens for each of the following.

1) $y = -(x-1)^2 + 4$

vertex:

stretch:

AoS:

x-ints:

y-int:

open:

Nov 13-7:36 AM

Find the vertex, the stretch, the axis of symmetry, the x-intercept, the y-intercept, and the direction the parabola opens for each of the following.

2) $y = -\frac{1}{4}(x+4)^2 + 1$

vertex: (-4, 1)

stretch: -1/4 wide

AoS: x = -4

x-ints: check if x-intercepts exist!?

y-int:

open: down

$y = -\frac{1}{4}(0+4)^2 + 1$

$-\frac{1}{4}\ 16$

$-4 + 1 = -3$

$0 = -\frac{1}{4}(x+4)^2 + 1$

$-1 \quad -1$

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

$\sqrt{4} = \sqrt{(x+4)^2}$

$-4 \pm 2 = x + 4$

-4

$x = -4+2 \quad , -4-2$

$x = -2 \quad , -6$

Nov 13-7:36 AM

Find the vertex, the stretch, the axis of symmetry, the x-intercept, the y-intercept, and the direction the parabola opens for each of the following.

3) $y = (x-1)^2 - 9$

vertex: right (1, -9)

stretch: 1, normal

AoS: x = 1

x-ints: Sub y=0

y-int: Sub x=0

open:

$0 = (x-1)^2 - 9$

$+9 \quad +9$

$\sqrt{9} = \sqrt{(x-1)^2}$

$1 \pm 3 = x - 1$

$+1$

$x = 1+3 \quad , 1-3$

$x = 4 \quad , -2$

Nov 13-7:36 AM

Standard Form: $f(x) = ax^2 + bx + c$

Vertex: $x = \frac{-b}{2a}$ then substitute back into equation to find y value.

x-intercepts: try factoring the equation check if x-intercepts exist!?

y-intercept: the y-intercept is the value of c

Stretch: a. a whole number makes parabola skinnier, fraction makes it wider.

Example: $f(x) = x^2 - 6x + 8$

Vertex: $y = (x-3)^2 - 1$ vertex $(3, -1)$

opt2 $x = \frac{-b}{2a} = \frac{-(-6)}{2(1)} = 3$

$y = (3)^2 - 6(3) + 8$

$9 - 18 + 8 = -1$ ✓

x-intercepts: $(x-2)(x-4)$ $x = 2, 4$

9, -2, -4, -6

y-intercept: 8

Nov 13-7:41 AM

Find the vertex, the stretch, the axis of symmetry, the x-intercept, the y-intercept, and the direction the parabola opens for each of the following.

1) $y = x^2 - 2x + 1$

$(x-1)(x-1)$ $(x^2 - 2x + 1)$

vertex: $(x-1)^2 + 0$ $(1, 0)$

stretch: 1

AoS: $x = 1$

x-ints: 1

y-int: sub $x = 0$ $0^2 - 2(0) + 1$

open: up

$x = \frac{-b}{2a}$ $\frac{2}{2} = 1$

Nov 13-7:43 AM

Find the vertex, the stretch, the axis of symmetry, the x-intercept, the y-intercept, and the direction the parabola opens for each of the following.

2) $y = \frac{1}{4}x^2 - x + 3$

vertex: $x = \frac{-b}{2a}$ $\frac{-(-1)}{2(1/4)} = \frac{1}{1/2} \cdot 2 = 2$ $(2, \frac{2}{3})$

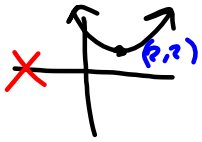
$\frac{1}{4}(2)^2 - (2) + 3 = 2$

$1 - 2 + 3 = 2$

stretch: 1/4 wider

AoS: $x = 2$

x-ints: check if x-intercepts exist!? No x-intercepts!



y-int: $\frac{1}{4}(0)^2 - 0 + 3 = 3$

open: up

$\frac{3}{4}$ CAN'T factor -1

Nov 13-7:43 AM

Find the vertex, the stretch, the axis of symmetry, the x-intercept, the y-intercept, and the direction the parabola opens for each of the following.

3) $y = -2x^2 + 20x - 51$

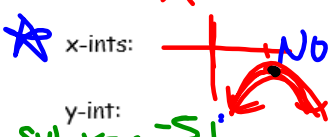
vertex: $x = \frac{-b}{2a}$ $\frac{-20}{2(-2)} = 5$ $(5, -1)$

$-2(5)^2 + 20(5) - 51 = -1$

stretch: -2

AoS: $x = 5$

x-ints: No x-intercepts



$-2 \cdot -51$

102

CAN'T factor

20

y-int: sub $x = 0$ -51

open: down

Nov 13-7:43 AM