

Day 1: Graphing Quadratics Review

1) Factored Form: $y = A(x-r)(x-s)$

Finding x-intercept(s):

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

Equation Zeros \downarrow \downarrow
 2 -4
 Graph $(2,0)$ $(-4,0)$

Finding y-intercept:

Plug in "0" for x

Finding the Axis of Symmetry (A of S):

$x = -1$



Finding the maximum or minimum:

y value in vertex.

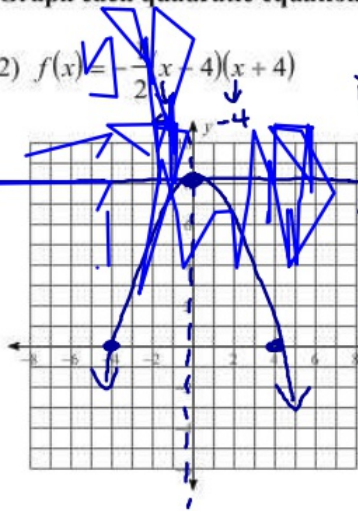
Finding the Vertex:

Plug in x into the A.O.S.

find y- (x, y)
 (A.O.S. min/max)

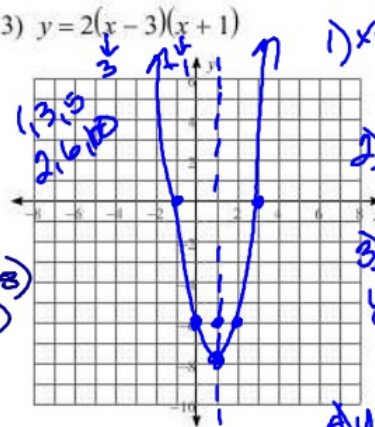
Graph each quadratic equation. List all key features.

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



- 1) x int $(4,0)$ $(-4,0)$
- 2) A.O.S $x = 0$
- 3) vertex $(0,8)$
 $y = -\frac{1}{2}(6-4)(0+4)$
 $= -\frac{1}{2}(-16)$
 $= 8$
- 4) y int $(0,8)$
- 5) ~~min~~ max $y = 8$

3) $y = 2(x-3)(x+1)$



- 1) x int $(3,0)$ $(-1,0)$
- 2) A.O.S $x = 1$
- 3) vertex $(1,-8)$
 $y = 2(1-3)(1+1)$
 $= 2(-2)(2) = -8$
- 4) y int $(0,-6)$
- 5) ~~min~~ max $y = -8$

We have learned to graph quadratics in 3 different forms. . . We will review today how to graph each form.

4) Standard Form: $y = Ax^2 + Bx + C$

Finding the Axis of Symmetry (A of S):

$$\text{AOS} = \frac{-b}{2a} = x$$

Finding the maximum or minimum:

Value of y in vertex

Finding the Vertex:

Plug in AOS for x
(AOS, min/max)

Finding x-intercept(s):

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

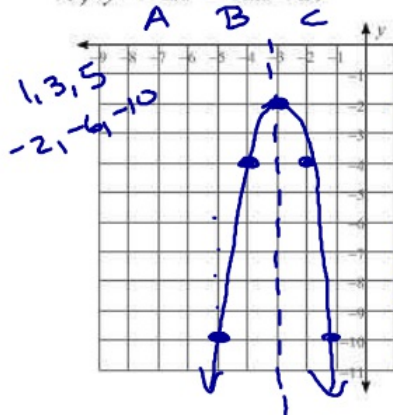
Finding y-intercept:

It's "C"!

(try graphing 1, 3, 5 first!)

Graph each quadratic equation. List all key features.

5) $y = -2x^2 - 12x - 20$



1) x-int
Imaginary

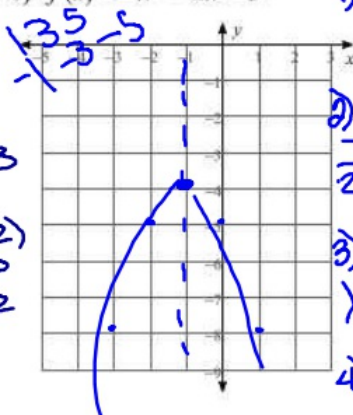
2) AOS $x = -3$
 $\frac{-b}{2a} = \frac{-(-12)}{2(-2)} = \frac{12}{-4} = -3$

3) Vertex $(-3, -2)$
 $y = -2(-3)^2 - 12(-3) - 20$
 $y = -18 + 36 - 20 = -2$

4) y-int
 $(0, -20)$

5) min max
 $y = -2$

6) $f(x) = -x^2 - 2x - 5$



1) x-int

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

3) Vertex $(-1, -4)$
 $y = -(-1)^2 - 2(-1) - 5$
 $y = -1 + 2 - 5 = -4$

4) y-int $(0, -5)$

5) min max
 $y = -4$

7) Vertex Form: $y = A(x - h)^2 + k$

Finding the Vertex:

$$(h, k)$$

Finding the maximum or minimum:

$$y = k$$

Finding the Axis of Symmetry (A of S):

$$x = h$$

Finding x-intercept(s):

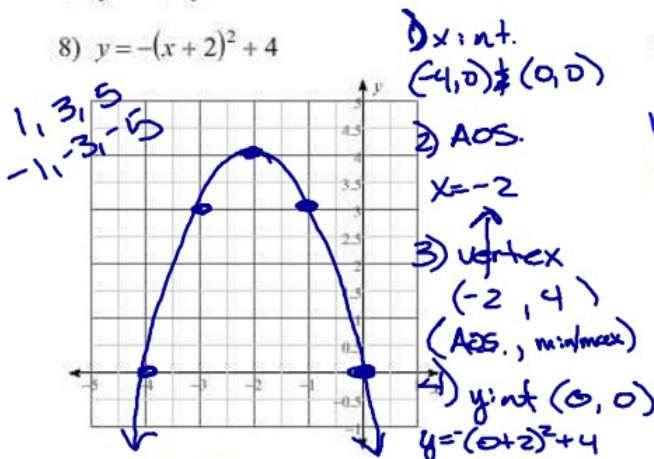
graph 1, 3, 5
plug in 0 for y

Finding y-intercept:

plug in 0 for x

Sketch the graph of each quadratic equation. List the x-intercept(s), y-intercept, vertex, and axis of symmetry.

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



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

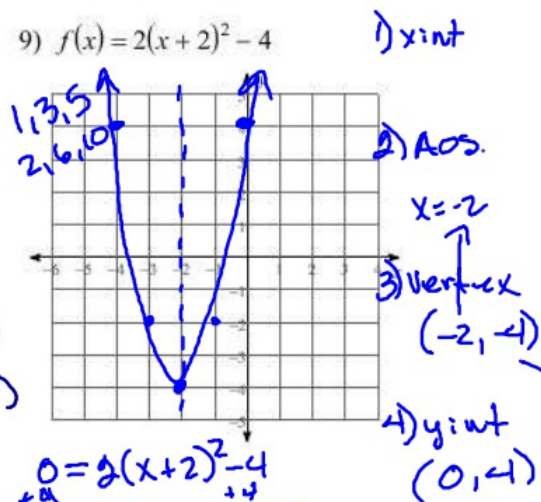
$$\frac{-4}{-4} = \frac{-(x+2)^2}{-4}$$

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

$$\frac{+2}{-2} = \frac{x+2}{-2} \quad x = \begin{cases} -2+2 = 0 \\ -2-2 = -4 \end{cases}$$

1) min/max
 $y = 4$

9) $f(x) = 2(x + 2)^2 - 4$



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

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

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

$$\frac{+\sqrt{2}}{-2} = \frac{x+2}{-2}$$

$$-2 \pm \sqrt{2}$$

1) min/max
 $y = -4$