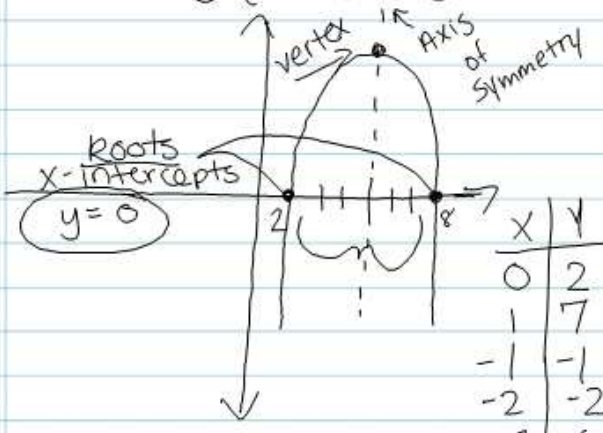
B1 Alg 2 10/24/

Quadratic Functions

- Anatomy - Parts - Axis of symmetry, vertex, roots
- Intercept form of a quadratic
- vertex form
- Axis of symmetry
- graphing - use table of values
- factoring (multiplying of binomials)

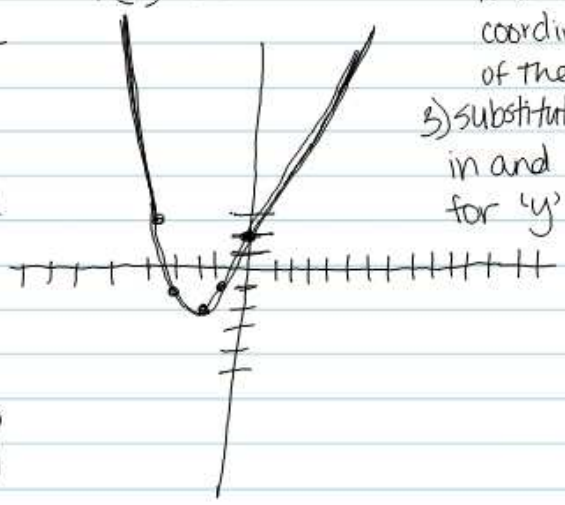
standard form
$f(x) = x^2 + 4x + 2$

vertex form
$f(x) = a(x-h)^2 + k$



x	y
0	2
1	7
-1	-1
-2	-2
-3	-1
2	14

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



2) graph
find AOS
is the x
coordinat
of the vert
3) substitute ba
in and sol
for 'y'

Binomial mult.

$(x+2)(x-3)$

$x^2 - x - 6$

multiply "everything" by everything

$x^2 + x - 6$

a · c	b
(1)(-6)	1
-6	
what 2 #'s multiply = -6	= 1

$f(x) =$

$(x+3)(x+3) - 2$

$f(x) = x^2 + 3x + 3x + 9 - 2$

$f(x) = x^2 + 6x + 7$

examples for you to do

vertex form → standard form

1) $f(x) = (x+3)^2 - 4$

2) $f(x) = (x-3)^2 + 2$

3) $f(x) = (x+2)^2$

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

find
- standard form graph
- find AOS
- find roots

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multiplication of binomials and how it pertains to quadratic functions.

★ review of distribute property $4(3-x) \rightarrow 12-4x$

★ Binomial multiplication multiply everything by everything $(2x+1)/(x-3)(x+2)$ $x^2+2x-3x$ x^2-x-6

★ vertex form of a quadratic $f(x)=a(x-h)^2+k$

★ Axis of symmetry $x=3$ Axis of symmetry 1/2 way between the roots

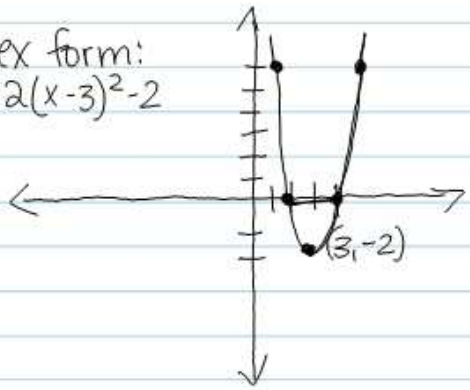
★ X, Y intercepts (Roots) (solutions) $(2,0)$ $(4,0)$ 3

★ ~~intercept form of a quadratic function~~

★ Standard form of a quadratic function $f(x)=ax^2+bx+c$

★ Graphing Quadratic functions from Standard form

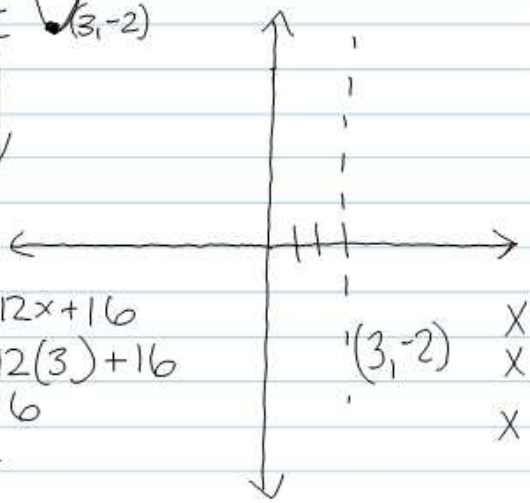
Vertex form:
$f(x)=2(x-3)^2-2$



$x=3$ (Axis of symmetry)
AOS the 'x' value of the vertex

$f(x)=2(x-3)^2-2$
$2(x-3)(x-3)-2$
$2(x^2-3x-3x+9)-$
$2x^2-12x+18-2$
$2x^2-12x+16$

find Standard form



$f(x)=2x^2-12x+16$
$2(3^2)-12(3)+16$
$-18+16$
-2

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

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1) how do I find the axis of symmetry from standard quadratic form?

$$f(x) = 2x^2 + 3x + 4$$
$$ax^2 + bx + c$$

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

AOS => $x = -3/4$

vertex $(-3/4\ ?)$

$$f(x) = 2(-3/4)^2 + 3(-3/4) + 4$$

$$\frac{18}{16} + \frac{108}{16} + 4$$

$$-\frac{90}{16} + \frac{64}{16} = \frac{-26}{16}$$

$f(x) = 2(x-3)^2 + 2$ vertex

$2(x-3)(x-3) + 2$
$2(x^2 - 3x - 3x + 9) + 2$
$2(x^2 + 6x + 9) + 2$
$2x^2 - 12x + 18 + 2$
$f(x) = 2x^2 - 12x + 20$

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

AOS: $\frac{-b}{2a} \Rightarrow \frac{-4}{2(1)} = \frac{-4}{2}$

AOS $\Rightarrow x = -2$

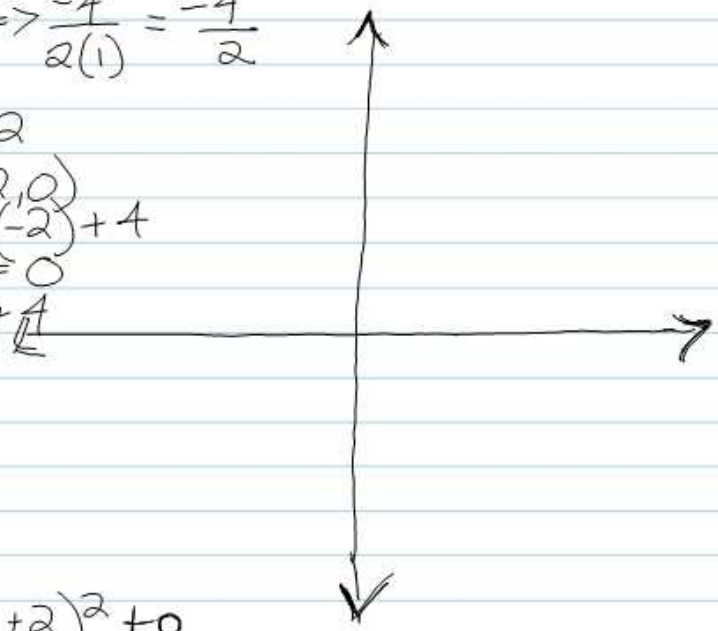
vertex $= (-2, 0)$

$(-2)^2 + 4(-2) + 4$

$4 - 8 + 4 = 0$

$(-1)^2 + 4(-1) + 4$

$1 - 4 + 4$



$a = 1$

$h = 2$

$k = 0$

$f(x) = 1(x + 2)^2 + 0$