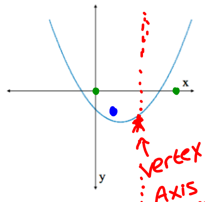
★ **GRAPHS**

Essential Aspects:



x-intercepts (crosses x-axis) "solutions, roots, zeroes b/c y=0"

y-intercept (cross y-axis) when x=0

Axis of symmetry (x = x coordinate of vertex)

I wouldn't want graphing to take you all day…
Each type of equation will help you along the way!
Each of these makes some part(s) so clear to see –
Know them very well, and EASY will graphing be! ☺

Intercept Form

ex. 2
$f(x)=(x-3)(x+5)$
- set each factor = 0 to find x-ints.
- $\frac{x_1+x_2}{2}$ = A of Sym. (from AoS)
- plug in x to find "y" of vertex

Vertex Form

like ex. 1
$f(x)=-(x+2)^2-3$
- use transformations to find vertex & AoS
- find one more close pt. & reflect it

Standard Form (factorable)

ex. 3
$f(x)=-x^2+4x+12$
★ factor
★ use "vertex form" strategies

Standard Form (not factorable)

ex. 5 & 6
AOS: $x=-b/2a$
find vertex
one more pt & reflect it

Dec 19-8:50 AM

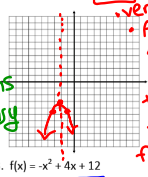
Name: ______ Date: ______ **Unit 5 Class Work**

Graphing Quadratic Functions Examples

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

reflects over x-axis; left 2; down 3
vertex (-2,-3)
- AoS: $x=-2$
- Another point: plug in a nice # for x
$x=-1$
$f(x)=-(1)^2-3$
$=-1-3=-4$
$(-1,-4)$
reflect it

★ No x-int ⇒ solutions are imaginary

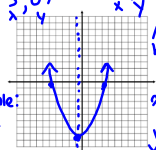


2. $f(x) = (x-3)(x+5)$

$x-3=0$, $x=3$, (3,0)
$x+5=0$, $x=-5$, (-5,0)
x-int

AoS: halfway btwn intercepts
$x=\frac{3-5}{2}=-1$
vertex $x=-1$
$y=(-4)(4)$
$y=-16$
$(-1,-16)$

y-scale: 1 unit = 2

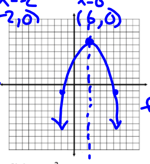


3. $f(x) = -x^2 + 4x + 12$

÷ −1
$f(x)=x^2-4x-12$
$(x+2)(x-6)$
$x=-2$, $x=6$
(-2,0), (6,0)

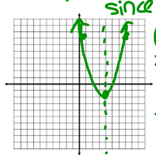
AoS: $x=\frac{-2+6}{2}=2$
$f(x)=-4+8+12$
$=-4+20$
$=16$

y-scale: 1 unit = 2



4. $f(x) = x^2 - 6x + 9$

$(x-3)(x-3)$
$x=3$
(3,0) ⇒ Also vertex, since only 1
AoS: $x=3$
- Another point
$x=0$
$y=9$ (0,9)
& reflect it



5. $f(x) = -2x^2 - 8x - 11$

6. $f(x) = 3x^2 - 6x + 1$

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

5. $f(x) = -2x^2 - 8x - 11$

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

a: -2 b: -8 c: -11

$x = \frac{8}{-4} = -2$

AOS

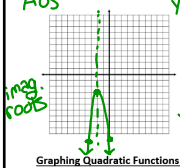
vertex: $x = -2$

$y = -2(4) - 8(-2) - 11$

$= -8 + 16 - 11$

$= -3$

$(-2, -3)$



imag. roots

• other point $x = 0$, $y = -11$ $(0, -11)$

∴ reflect it

6. $f(x) = 3x^2 - 6x + 1$

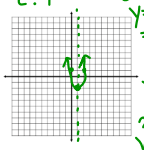
a: 3 b: -6 c: 1

AOS: $x = \frac{-6}{6} = 1$

$y = 3 - 6 + 1$

$= -2$

$(1, -2)$ vertex



$x = 0$

$y = 1$ $(0, 1)$

reflect it

Graphing Quadratic Functions Practice

For each function,

- State the form the function is in.
- Determine the transparent aspects.
- Create a graph of the function using three points, on graph paper.

*Be sure to identify your x-scale and y-scale!

1. $f(x) = -2x^2 + 8x - 10$

2. $f(x) = 2x^2 - 2x - 12$

3. $f(x) = (2x - 4)(x + 5)$

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

5. $f(x) = 4x^2 - 12x + 9$

6. $f(x) = 4x^2 - 16x + 3$

Name: _____ Date: _____ **Unit 5 Class Work**

7. $f(x) = -(x + 3)^2 - 7$

8. $f(x) = x^2 + 16x + 60$