

## Graphing Quadratic Equations WS 1

Graph each of the following quadratic functions. Identify the appropriate characteristics.

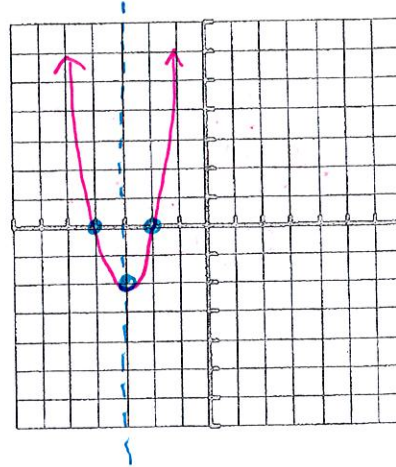
1.  $f(x) = 2(x+2)(x+4)$

x-Intercept(s):  $(-2, 0)$   $(-4, 0)$

Vertex:  $(-3, -2)$

Axis of Symmetry:  $x = -3$

y-intercept:  $(0, 16)$



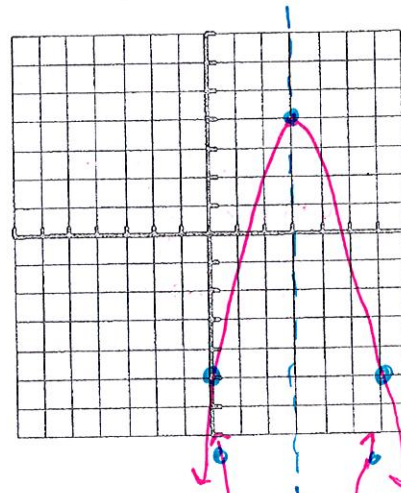
2.  $g(x) = -(x-3)^2 + 4$

x-Intercept(s):  $(1, 0)$   $(5, 0)$

Vertex:  $(3, 4)$

Axis of Symmetry:  $x = 3$

y-intercept:  $(0, -5)$



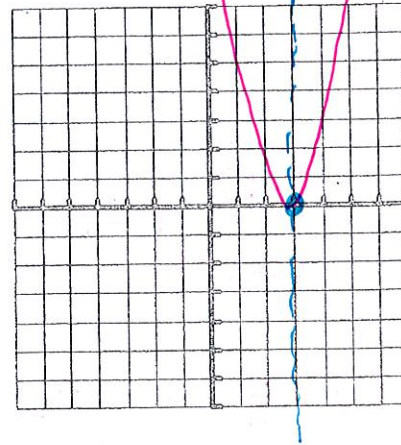
3.  $f(x) = 2x^2 - 12x + 18$

x-Intercept(s):  $(3, 0)$

Vertex:  $(3, 0)$

Axis of Symmetry:  $x = 3$

y-intercept:  $(0, 18)$



$$x = \frac{-b}{2a} = \frac{12}{2 \cdot 2} = 3$$

intercept  
formvertex  
formstandard  
form

Graphing:

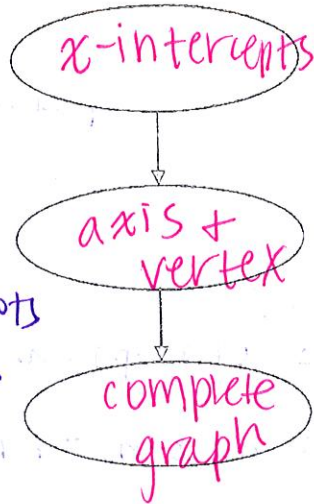
Steps:

I. Intercept Form

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

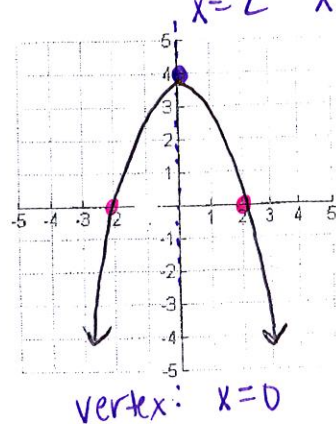
$p$  and  $q$  are the  $x$ -intercepts/zeros/roots

$a$  determines direction - up or down and width.



Example:

$a = -1$   
Graph  $f(x) = -(x - 2)(x + 2)$

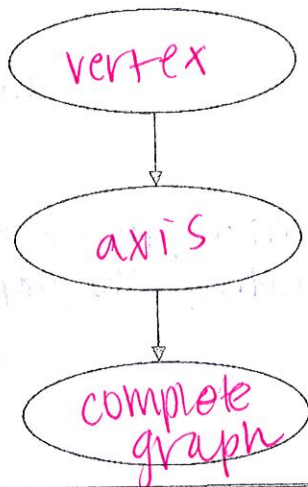


II. Vertex Form

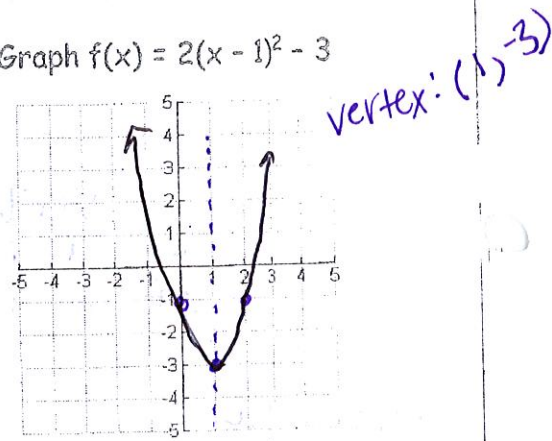
$$f(x) = a(x - h)^2 + k$$

$(h, k)$  is the vertex.

$a$  determines the direction - up or down and width.



Graph  $f(x) = 2(x - 1)^2 - 3$

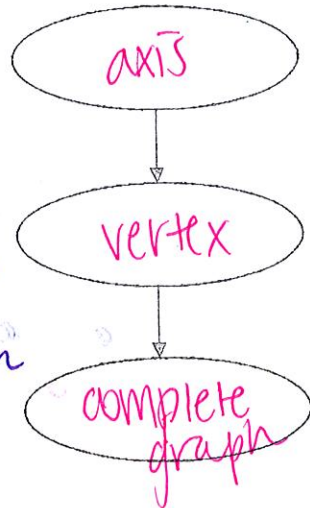


III. Standard Form

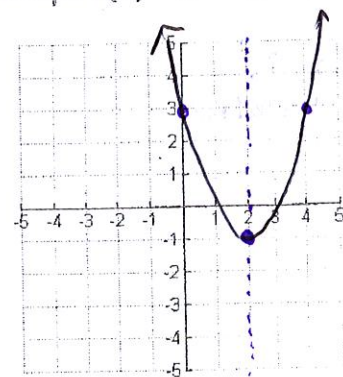
$$f(x) = ax^2 + bx + c$$

$x = \frac{-b}{2a}$  gives the axis of symmetry

$a$  determines the direction - up or down and width.



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



$$x = \frac{-b}{2a} = \frac{-(-4)}{2(1)} = \frac{4}{2} = 2$$