Name: _____
Period: ____

Warm-up: *before* Completing the Square

1. Given the graph of $f(x)$

a) State the y-intercept (0, 0)

b) State the x-intercepts (-4, 0) and (0, 0)

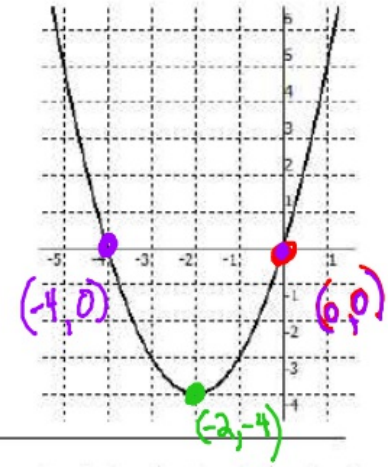
c) Write the equation of the function

$f(x) = (x + 2)^2 - 4$ in vertex form

$f(x) = (x+4)(x\ \ )$ in factored form

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

$f(x) =$



2. Given the graph of $g(x)$

a) State the y-intercept (0, -9)

b) State the x-intercept (3, 0)

c) Write the equation of the function

$g(x) = -(x - 3)^2$ in vertex form

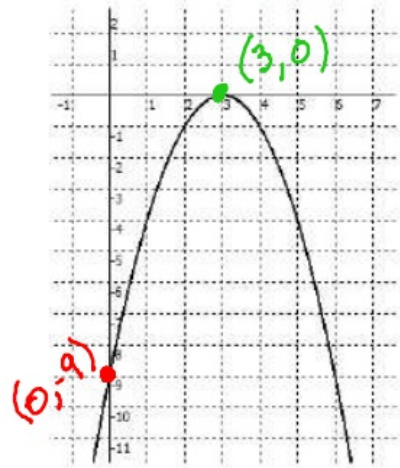
$g(x) = -(x-3)(x-3)$ in factored form

$g(x) = -[x^2 - 3x - 3x + 9]$ in standard form

$g(x) = -[x^2 - 6x + 9]$

$g(x) = -x^2 + 6x - 9$

$g(x) =$



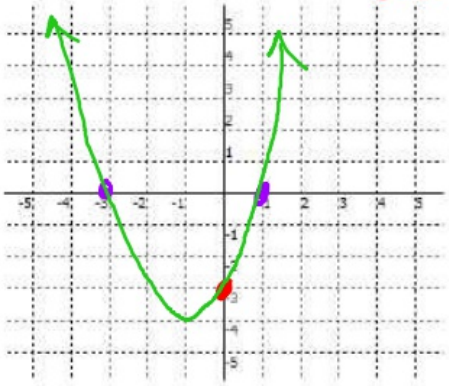
Determine the x-intercepts and y-intercept.
Draw a rough sketch of the function.

3. $h(x) = (x-1)(x+3)$

x-intercept(s): (1, 0) (-3, 0)

y-intercept: (0, -3)

$(0-1)(0+3)$
$(-1)(3)$
-3

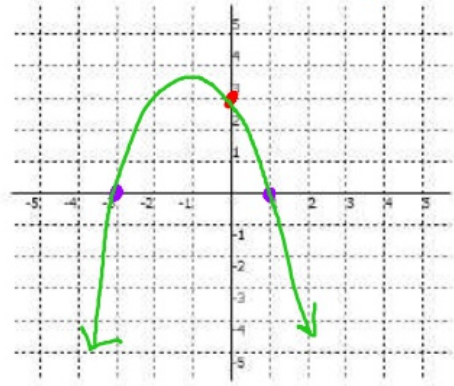


4. $k(x) = -(x-1)(x+3)$

x-intercept(s): (-3, 0) (1, 0)

y-intercept: (0, 3)

$-(0-1)(0+3)$
$-(-1)(3)$
3



3 ***interchangeable*** **terms for the point(s) where a function crosses the *x*-axis**

Solutions zeros roots

x-intercepts

List 4 of the methods to solve quadratic equations we have discussed in class

1) Quadratic formula
2) Factoring
3) Square Roots
4) Graphing Calculator

Different forms of a quadratic equation

Standard Form
$f(x) = x^2 + 2x - 8$

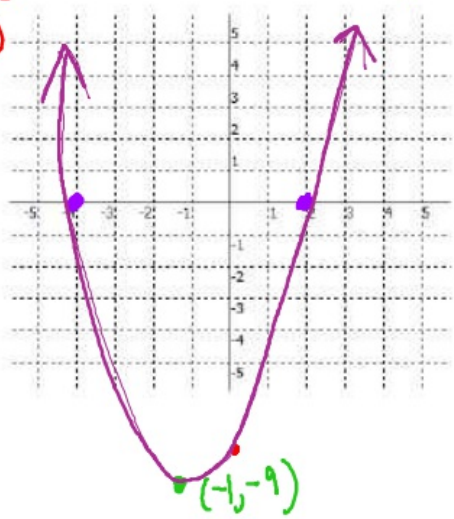
$f(0) = (0)^2 + 2(0) - 8$
$f(0) = -8$
y-int $(0, -8)$

Intercept Form
$f(x) = (x+4)(x-2)$

x-int $(-4, 0)$ $(2, 0)$

Vertex Form
$f(x) = (x+1)^2 - 9$

Vertex $(-1, -9)$



Vertex form of a quadratic equation

highest or lowest point on a parabola

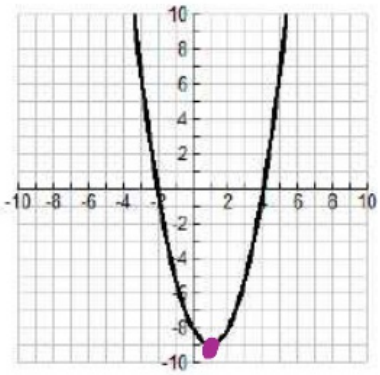
$$f(x) = (x-h)^2 + k$$

vertex: (h, k)

Given each graph,

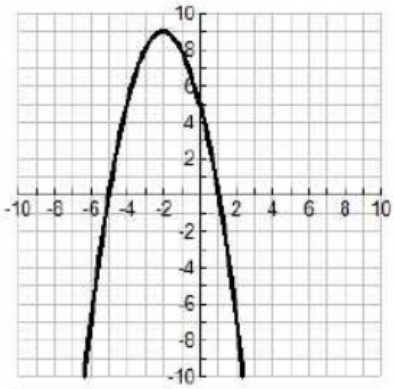
(a) determine the vertex and

(b) write the equation of the function in vertex form



1. **Vertex:** (1 , -9)

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



2. **Vertex:** (-2, 9)

Equation: $-(x+2)^2 + 9 = 0$

Given an equation: Find **(a) vertex,** **(b) if the vertex is a maximum or minimum,** **(c) y-intercept,** **(d) then, sketch a rough graph**

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

vertex: (-1 , 4)

maximum / minimum

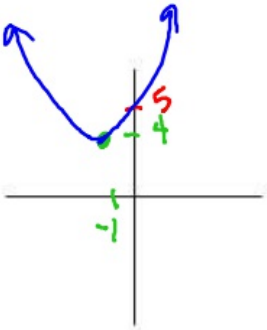
y-intercept: (0 , 5)

$(0+1)^2+4$

$(1)^2+4$

$1+4$

5



4. $f(x) = -3(x-2)^2 + 8$

vertex: (2 , 8)

maximum / minimum

y-intercept: (0 , -4)

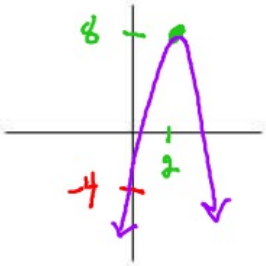
$-3(0-2)^2+8$

$-3(-2)^2+8$

$-3(4)+8$

$-12+8$

-4



Given an equation: Rewrite the equation in the form of $f(x) = (x-h)^2 + k$

(a) vertex, **(b) if the vertex is a maximum or minimum,**
(c) y-intercept, **(d) then, sketch a rough graph**

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

$\left(\frac{6}{2}\right)^2 = (3)^2 = 9$

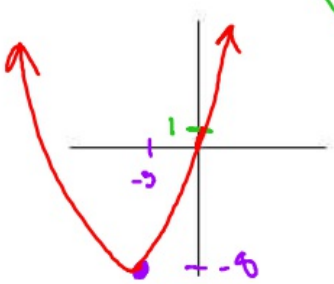
$f(x) = x^2 + 6x + 9 + 1 - 9$

$f(x) = (x+3)^2 + 1 - 9$

$f(x) = (x+3)^2 - 8$

vertex: (-3, -8)
maximum / minimum
y-intercept: (0 , 1)

$(0+3)^2 - 8$
$3^2 - 8$
$9 - 8$
1



6. $f(x) = x^2 - 2x - 8$

$\left(\frac{-2}{2}\right)^2 = (-1)^2 = 1$

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

$f(x) = (x-1)^2 - 8 - 1$

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

vertex: (1 , -9)
maximum / minimum
y-intercept: (0 , -8)

$(0)^2 - 2(0) - 8$
-8