8.1 Quadratic graph and their properties

1)

$$\overset{A}{} \quad \overset{B}{} \quad \overset{C}{}$$
$$y = 2x^2 - 4x - 1$$

Find line of symmetry

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

axis of symmetry. $\boxed{x = 1}$

to find the vertex

$$y = 2x^2 - 4x - 1$$
$$2(1)^2 - 4(1) - 1$$
$$2(1) - 4 - 1$$
$$2 - 4 - 1$$
$$2 - 5$$
$$-3$$

minimum → -3

$\boxed{\text{vertex } (1, -3)}$

It opens up $2x^2 - 4x - 1$ it has a minimum

The y intercept will be the $C = -1$

2) $y = x^2 - 6x + 8$

Find the axis of symmetry

$x = \frac{-b}{2a}$ $\frac{--6}{2(1)}$ $\frac{6}{2} = 3$

$x = 3$

Find the vertex

$y = x^2 - 6x + 8$

$(3)^2 - 6(3) + 8$

$9 - 18 + 8$

$y = -1$ x y

vertex $(3, -1)$

minimum; -1

y-intercept is at 8

3) $y = -3x^2 + 6x + 2$

Find the axis of symmetry

$x = \frac{-b}{2a}$ $\quad \frac{-6}{2(-3)}$ $\quad \frac{-6}{-6} = 1$

axis of symmetry $x = 1$

Find the vertex.

$y = -3x^2 + 6x + 2$

$y = -3(1)^2 + 6(1) + 2$

$y = -3(1) + 6 + 2$

$y = -3 + 8$

$y = 5$

vertex (x, y) $(1, 5)$

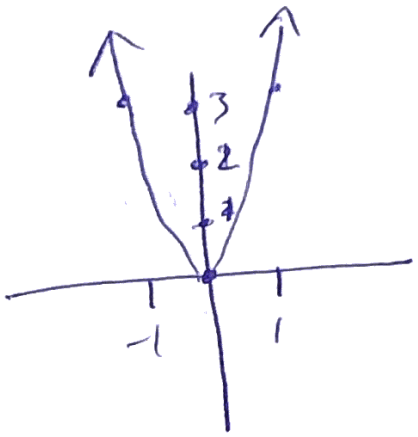
maximum at $\frac{5}{2}$

y intercept

4) graph 8.1 notes.

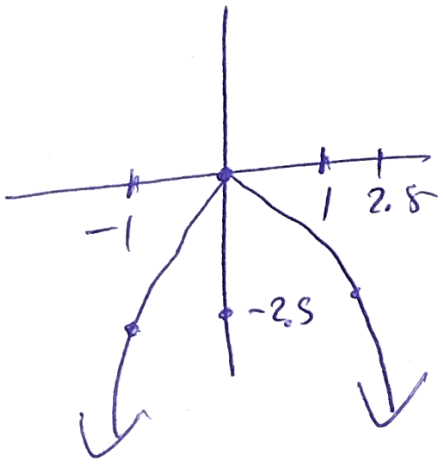
$f(x) = 3x^2$

x	$3x^2$	y
-1	$3(-1)^2$ $3(1)$	3
0	$3(0)^2 = 0$	0
1	$3(1)^2 = 3(1)$	3



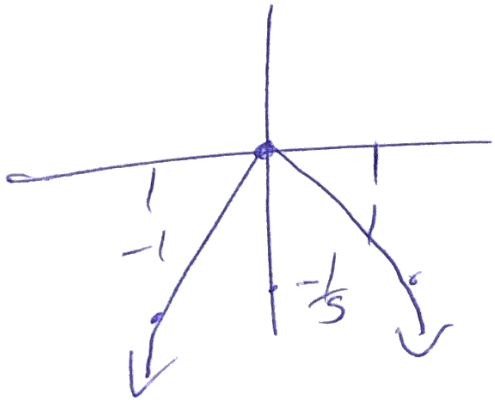
5) $f(x) = -2.5x^2$

x	$-2.5x^2$	y
-1	$-2.5(-1)^2$ -2.5	-2.5
0	$-2.5(0)$	0
1	$-2.5(1)^2$ -2.5	-2.5



6) $f(x) = -\frac{1}{5}x^2$

-1	$-\frac{1}{5}(-1)^2$ $-\frac{1}{5}(1)$	$-\frac{1}{5}$
0	$-\frac{1}{5}(0)$	0
1	$-\frac{1}{5}(1)^2$ $-\frac{1}{5}(1)$	$-\frac{1}{5}$



Order each group of quadratic functions from widest to narrowest graph.

7) $y = -3x^2$, $y = -5x^2$, $y = -1x^2$

$y = -x^2$, $y = -3x^2$, $y = -5x^2$

8) $y = 4x^2$, $y = -2x^2$, $y = -6x^2$

$y = -2x^2$, $y = 4x^2$, $y = -6x^2$

9) $y = x^2$, $y = \frac{1}{3}x^2$, $y = 2x^2$

$y = \frac{1}{3}x^2$, $y = x^2$, $y = 2x^2$

10) $y = \frac{1}{6}x^2$, $y = \frac{1}{4}x^2$, $y = \frac{1}{2}x^2$

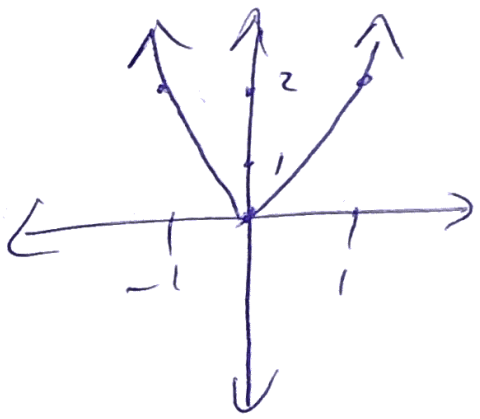
$y = \frac{1}{6}x^2$, $y = \frac{1}{4}x^2$, $y = \frac{1}{2}x^2$

11)

11) Graph each function

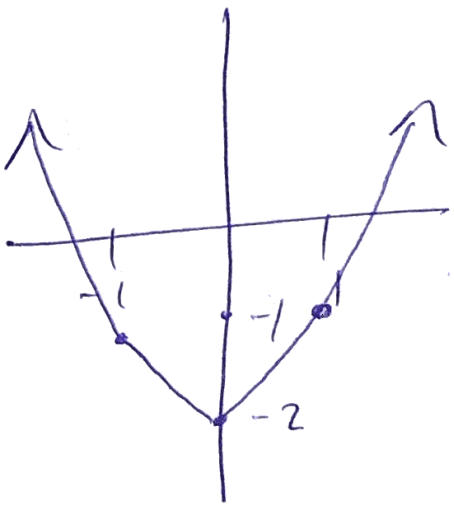
$f(x) = x^2 + 1$

x	x^2+1	y
-1	$(-1)^2+1$ $1+1$	2
0	$(0)^2+1$ $0+1$	1
1	$(1)^2+1$ $1+1$	2



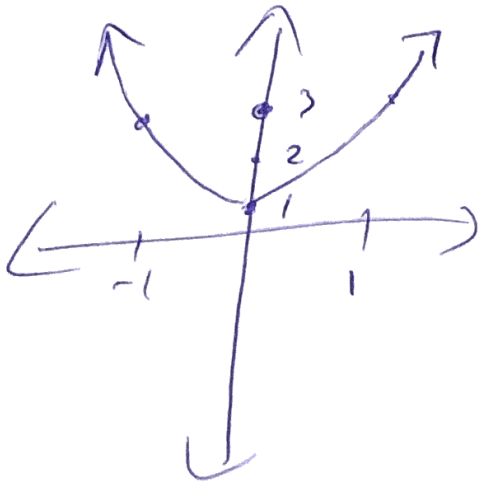
12) $f(x) = x^2 - 2$

x	x^2-2	y
-1	$(-1)^2-2$ $1-2$	-1
0	$(0)^2-2$ $0-2$	-2
1	$(1)^2-2$ $1-2$	-1



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

x	$2x^2+1$	y
-1	$2(-1)^2+1$ $2(1)+1$ $2+1$	3
0	$2(0)^2+1$ $2(0)+1$ $0+1$	1
1	$2(1)^2+1$ $2(1)+1$ $2+1$	3



Section 9.1A: Graphing Quadratic Functions Using Tables
Guided Notes
Honors Algebra I

Name: _____

Date: _____

Quadratic Functions

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

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

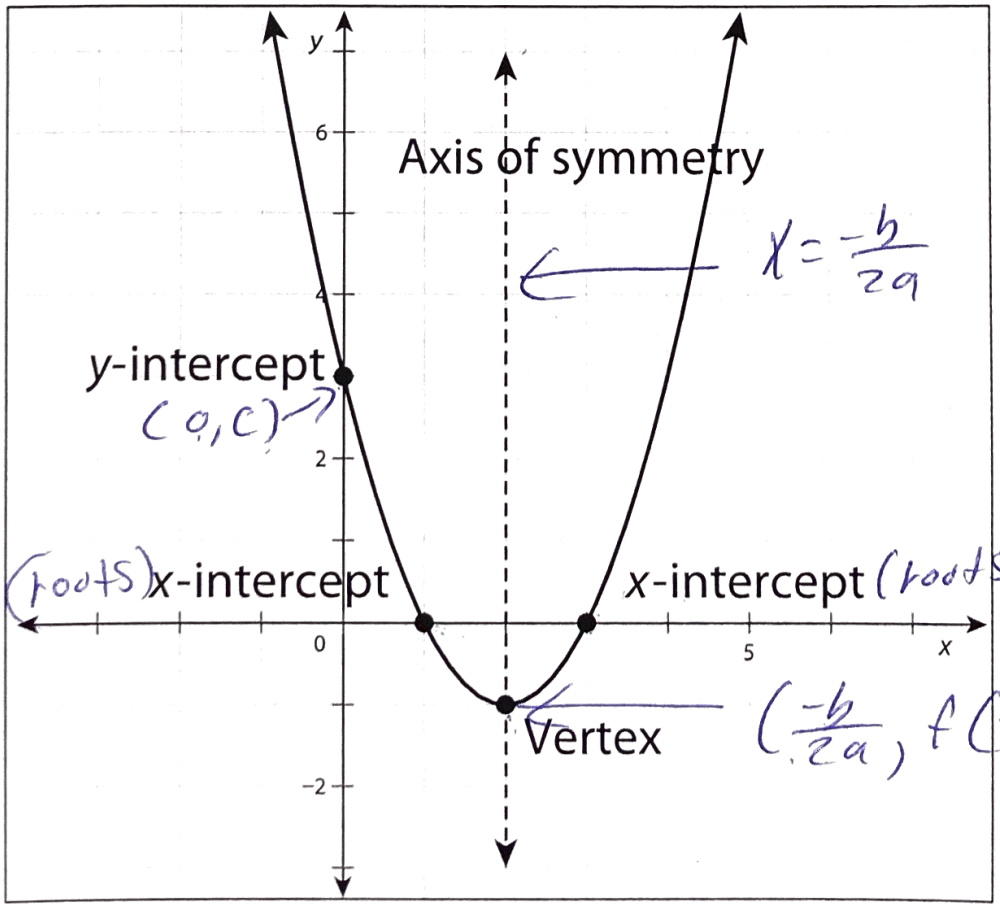
*** Factored Form**

Period.

Name
Date.

1)

Key Components of a Quadratic Function



2)

Graphing in STANDARD FORM – $f(x) = ax^2 + bx + c$

$a = 4$

$b = -8$

$c = 1$

EXAMPLE - Graph the function: $f(x) = 4x^2 - 8x + 1$

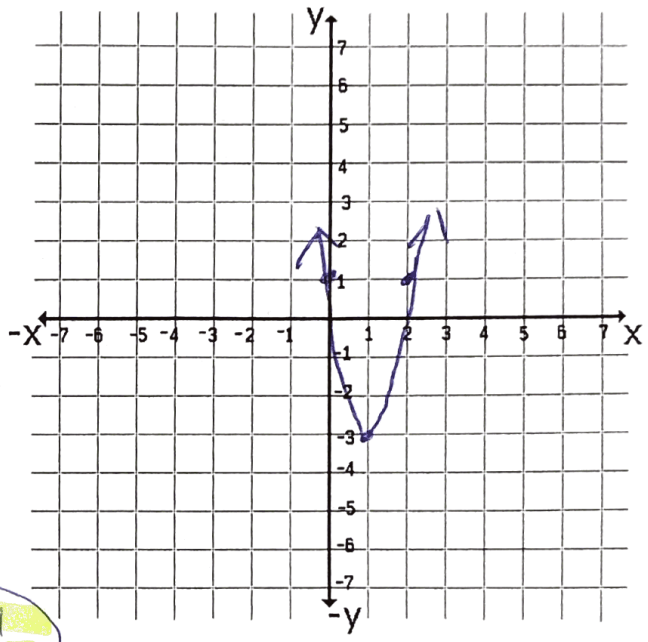
To find the axis of symmetry:

$x = -\frac{b}{2a} = \frac{-(-8)}{2(4)} = \frac{8}{8} = 1$

To find the vertex, plug 1 back into the equation.

$f(1) = 4(1)^2 - 8(1) + 1 = -3$

$4 - 8 + 1$



Key Features:

a = 4 b = -8 c = 1

The parabola will open (UP) or DOWN

The parabola has a MAX or (MIN)

The axis of symmetry at x = 1

Vertex at (1 , -3)

y-intercept = (0 , 1)

point = (-1 , 13)

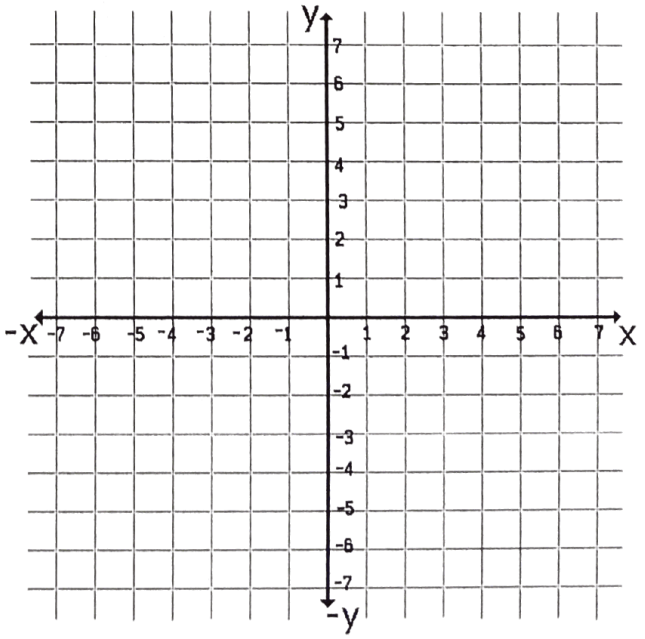
(0, 1)

(1, -3)

Domain: all real numbers

Range: $y \geq -3$

YOU TRY - Graph the function: $f(x) = -\frac{1}{2}x^2 + 2x - 1$



Key Features:

a = _____ b = _____ c = _____

The parabola will open UP or DOWN

The parabola has a MAX or MIN

The axis of symmetry at x = _____

Vertex at (,)

y-intercept = (,)

point = (,)