Algebra 1 9.1 Homework (day 2) Name: Key

Tell whether the graph opens up or down. Write an equation of the axis of symmetry.

1. $y = x^2 + 4x - 1$ up

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

2. $y = 3x^2 + 8x - 6$ up

$x = \frac{-(8)}{2(3)} = \frac{-4}{3}$ $x = -\frac{4}{3}$

3. $y = -x^2 - 4x + 2$ down

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

4. $y = -x^2 + 4$ down

$x = -\frac{(0)}{2(-1)} = 0$ $x = 0$

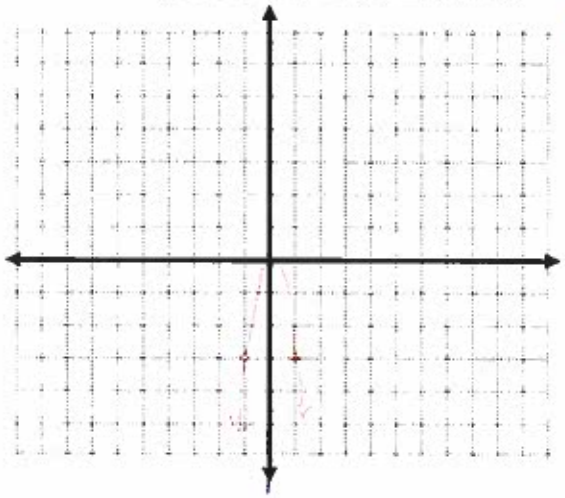
Graph the following functions. Label the vertex.

5. $y = 3x^2$ down

x	1	-1	2	-2
y	3	3	12	12

axis $x = 0$

V $(0, 0)$

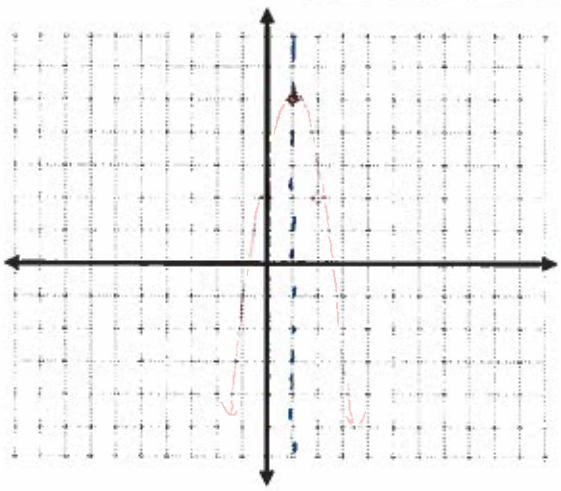


6. $y = 3x^2 + 6x + 2$ down

x	1	0	-1	-2
y	2	2	7	7

axis $x = -1$

V $(-1, -1)$

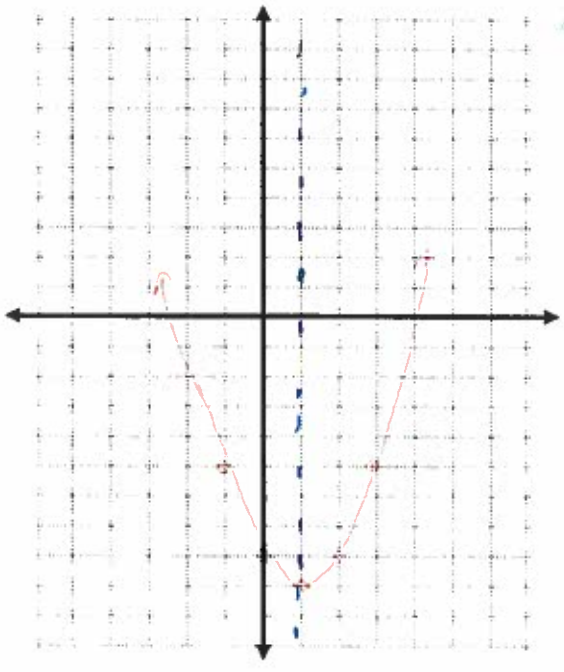


7. $y = x^2 - 2x - 8$ up

x	0	2	-1	3
y	-8	-8	-5	-5

axis $x = 1$

V $(1, -9)$

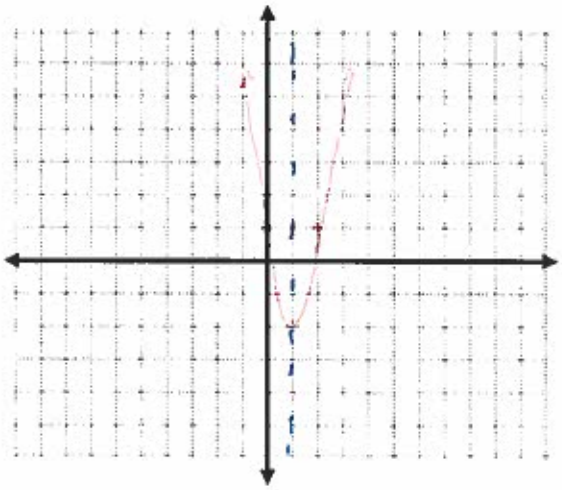


8. $y = 3x^2 - 6x + 1$ up

x	0	2	-1	3
y	1	1	10	10

axis $x = 1$

V $(1, -2)$



Name: Key

9.1 Standard Form

1) Sketch a graph of the function $y = x^2 - 6x + 8$.

Step 1: Put in S.F. & identify the a, b and c.

$a =$ 1 $\quad b =$ −6 $\quad c =$ 8

The parabola:

circle one → opens up / opens down

a is positive

Step 2: Plug into line of symmetry formula, $x = \dfrac{-b}{2a}$. (be sure to graph the vertical line)

$x = \dfrac{-(-6)}{2(1)} = \dfrac{6}{2} = 3$ $\quad x = 3$

Step 3: Find the vertex (find the y).

(3 ; −1)

plug in x

To find y, plug x into equation and solve.

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

$y = 9 - 18 + 8$

$y = -1$

plug in y

Step 4: Plot vertex and create an $x - y$ table. Pick one x value to the left and right of the vertex. Specifically choose values to the left and right of the 'x' value.

	x	y
1 away	2	0
	4	0
2 away	1	3
	5	3

symmetrical!

Point 1

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

$y = 4 - 12 + 8$

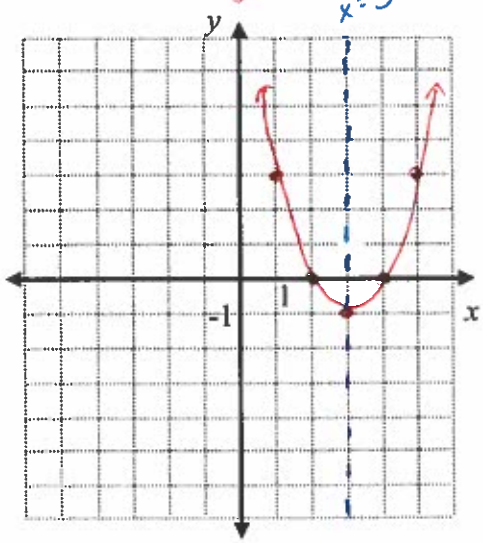
$y = 0$

Point 2

find on other side of axis of symm.

y-int (0, 8)

a.o.s. $x = 3$



Step 5: Plot the points you just found and connect the points to make a parabola.

original → $y = x^2 - 6x + 8$

$y = (x - 4)(x - 2)$

x-int: 4, 2

a.o.s. $x = 3$

$v = (3, -1)$

NOTE:
Rewriting the equation in intercept form first may be an easier approach.