

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

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

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

$$x = -2$$

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

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

$$x = -\frac{4}{3}$$

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

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

$$x = 2$$

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

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

$$x = 0$$

Graph the following functions. Label the vertex.

5. $y = -3x^2$

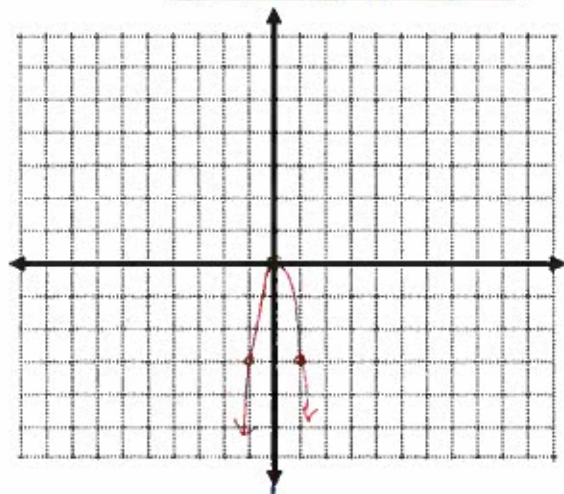
x	1	-1	2	-2
y	-3	-3	-12	-12

a.o.s.

$$x = 0$$

v

$$(0, 0)$$



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

x	2	0	3	-1
y	2	2	-7	-7

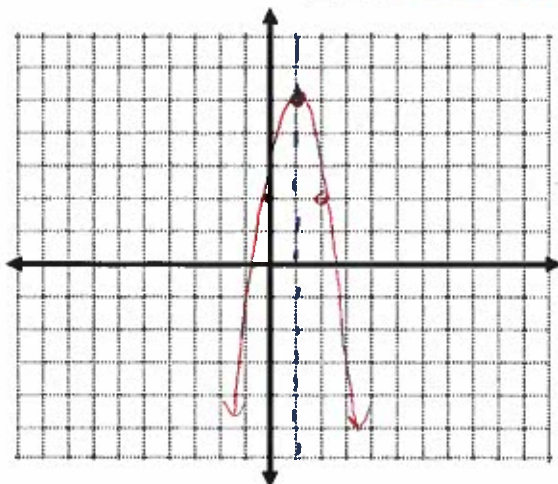
down

a.o.s.

$$x = 1$$

v

$$(1, 5)$$



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

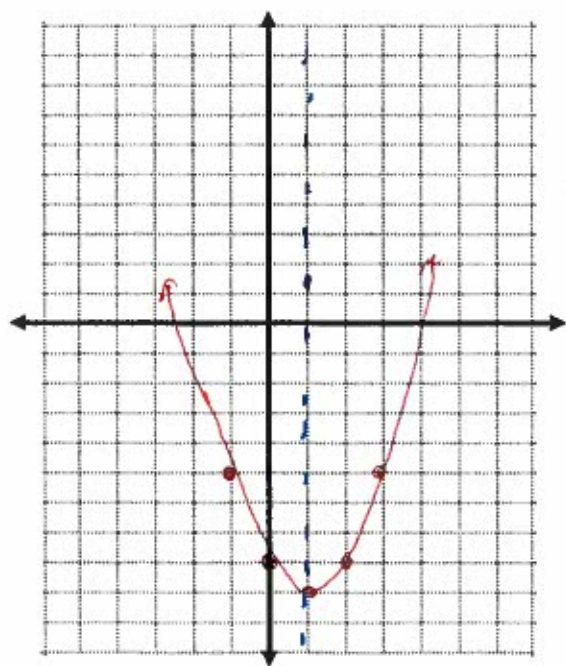
x	0	2	-1	3
y	-8	-8	-5	-5

a.o.s.

$$x = 1$$

v

$$(1, -9)$$



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

x	0	2	-1	3
y	1	1	10	10

up

a.o.s.

$$x = 1$$

v

$$(1, -2)$$

