

Section 6.1 – Practice Questions

Determine whether the graph of each quadratic opens upwards or downwards, why?

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

opens up ; $a > 0$

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

opens down ; $a < 0$

3. $y = -3(x-1)^2 + 2$

opens down $a < 0$

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

opens down ; $a < 0$

5. $y + 2x - x^2 = 0$

$y = x^2 - 2x$

opens up ; $a > 0$

6. $x^2 + 2x + y = 0$

$y = -x^2 - 2x$

opens down ; $a < 0$

Graph the quadratic function. Plot at least 4 points other than vertex.

7. $y = x^2$

x	y
0	0
1	1
-1	1
± 2	4

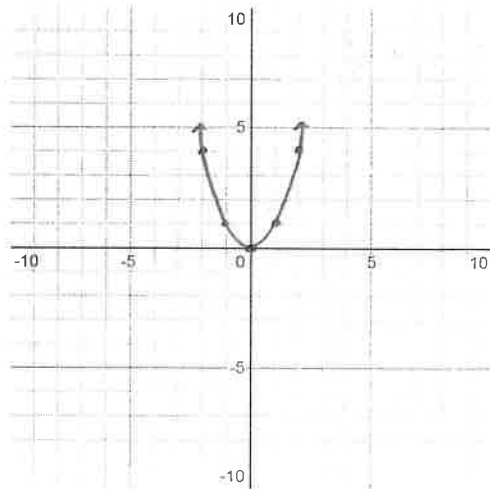
Vertex: (0,0)

Max/Min: (0,0)

Axis of Symmetry: $x = 0$

Domain: \mathbb{R}

Range: $y \geq 0$



8. $y = -x^2$

x	y
0	0
1	-1
-1	-1
± 2	-4

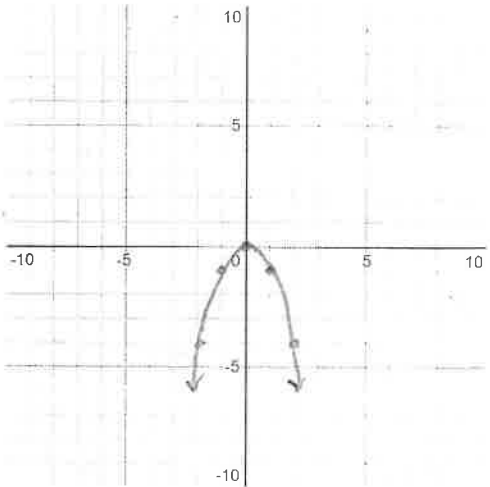
Vertex: (0,0)

Max/Min: (0,0)

Axis of Symmetry: $x = 0$

Domain: \mathbb{R}

Range: $y \leq 0$



9. $y = x^2 - 2$

x	y
0	-2
±1	-1
±2	2
±3	7

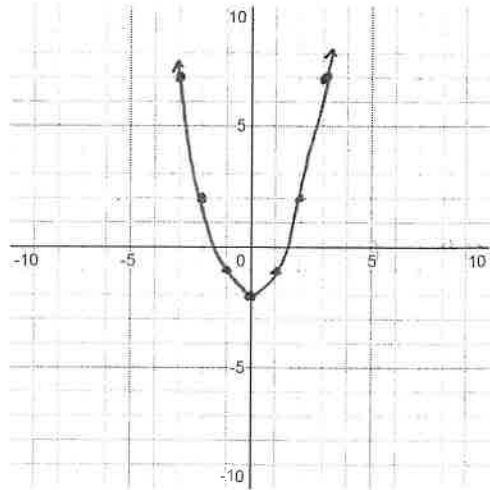
Vertex: (0, -2)

Max/Min: (0, -2)

Axis of Symmetry: x = 0

Domain: \mathbb{R}

Range: $y \geq -2$



10. $y = (x - 2)^2$

x	y
0	4
2	0
1	1
3	1
4	4

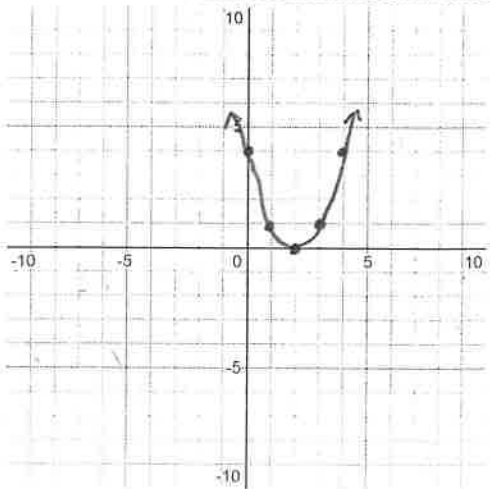
Vertex: (2, 0)

Max/Min: (2, 0)

Axis of Symmetry: x = 2

Domain: \mathbb{R}

Range: $y \geq 0$



11. $y = -(x + 1)^2 + 2$

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

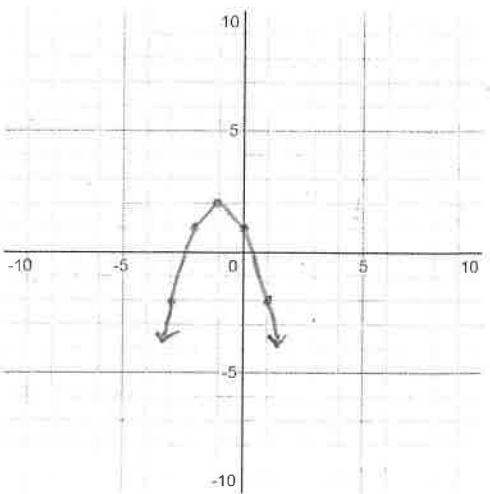
Vertex: (-1, 2)

Max/Min: (-1, 2)

Axis of Symmetry: x = -1

Domain: \mathbb{R}

Range: $y \leq 2$



12. $y = \frac{1}{2}(x + 2)^2 - 2$

x	y
-2	-2
0	0
-4	0
2	6
-6	6

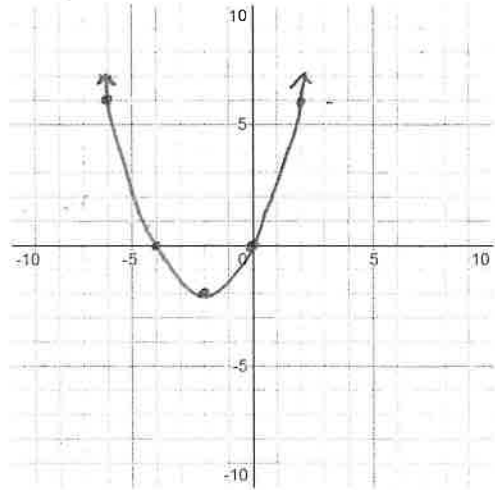
Vertex: (-2, -2)

Max/Min: (-2, -2)

Axis of Symmetry: x = -2

Domain: \mathbb{R}

Range: $y \geq -2$



13. $y = -\frac{1}{2}(x - 2)^2 + 3$

x	y
2	3
0	1
4	1
-2	-5
6	-5

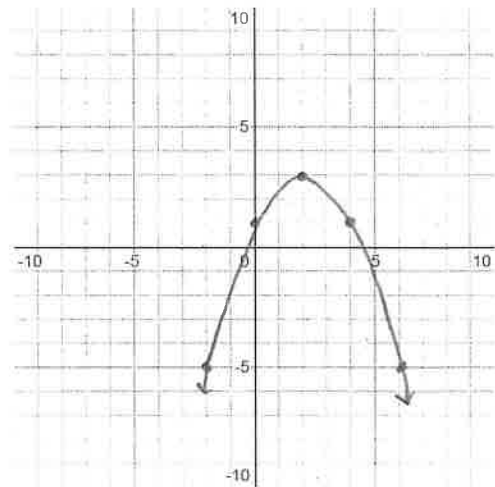
Vertex: (2, 3)

Max/Min: (2, 3)

Axis of Symmetry: x = 2

Domain: \mathbb{R}

Range: $y \leq 3$



14. $y = -2(x - 1)^2 - 2$

x	y
1	-2
2	-4
0	-4
3	-10
-1	-10

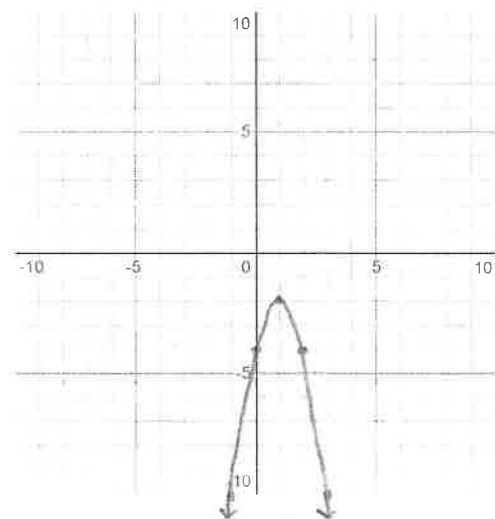
Vertex: (1, -2)

Max/Min: (1, -2)

Axis of Symmetry: x = 1

Domain: \mathbb{R}

Range: $y \leq -2$



15. $y - 4 = -\frac{2}{3}(x + 2)^2$

x	y
-2	+4
1	-2
-5	-2
0	$\frac{4}{3}$
-4	$\frac{4}{3}$

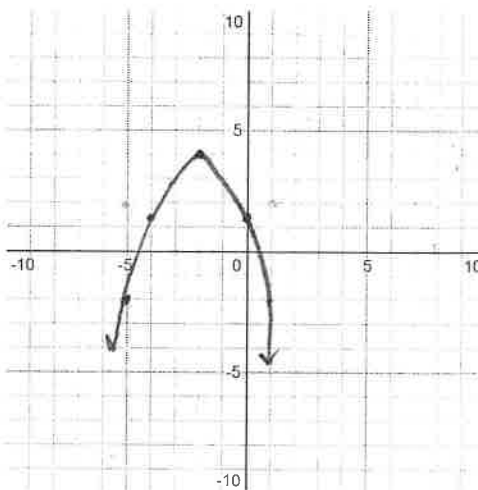
Vertex: (-2, 4)

(Max/Min): (-2, 4)

Axis of Symmetry: x = -2

Domain: \mathbb{R}

Range: $y \leq 4$



16. $y + 3 = \frac{3}{4}(x - 4)^2$

x	y
4	-3
2	0
6	0
8	9
0	9

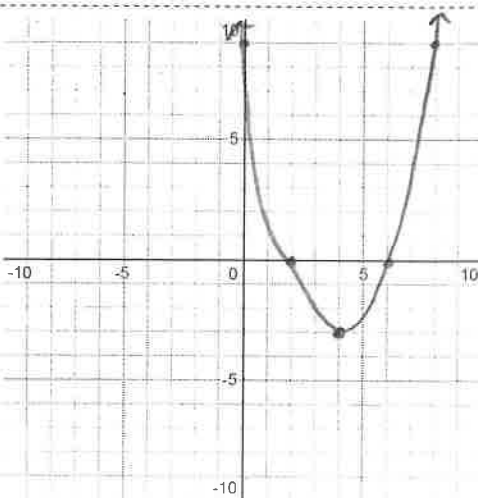
Vertex: _____

Max/Min: _____

Axis of Symmetry: _____

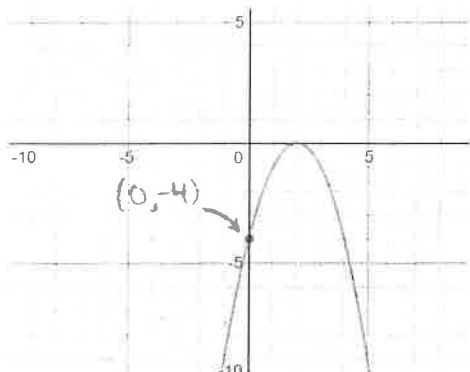
Domain: _____

Range: _____



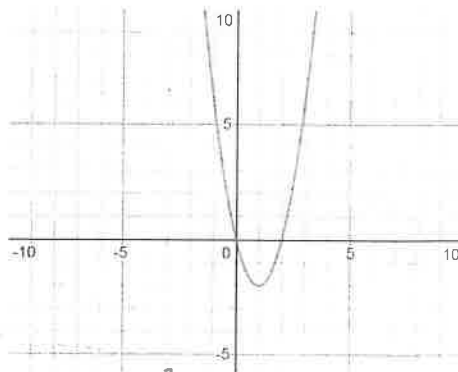
Determine an equation for the Parabola.

17.



Vertex: (2, 0)
 $y = a(x - 2)^2$
 $-4 = a(0 - 2)^2$
 $-4 = a(4)$
 $a = -1$
 $y = -(x - 2)^2$

18.



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

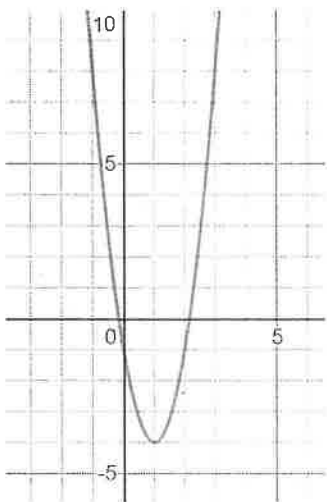
19.

$$y = a(x-1)^2 - 4$$

$$-1 = a(0-1)^2 - 4$$

$$-1 = a - 4$$

$$a = 3$$



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

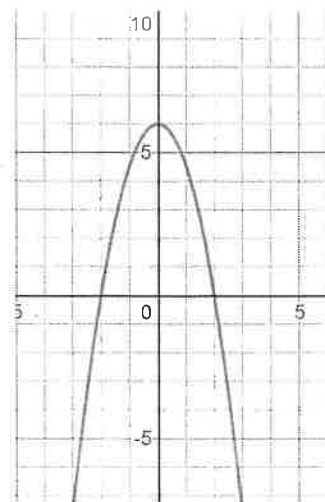
20.

$$y = a(x)^2 + 6$$

$$0 = a(2)^2 + 6$$

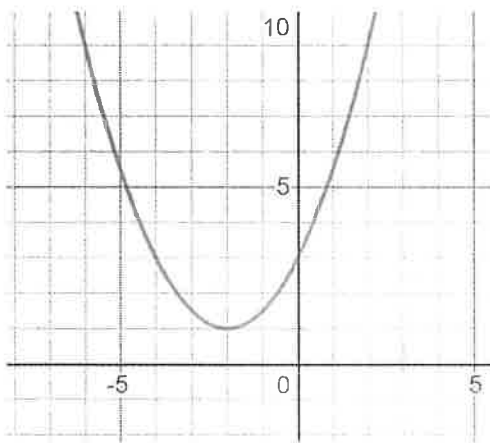
$$-6 = 4a$$

$$a = -\frac{3}{2}$$



$$y = -\frac{3}{2}(x)^2 + 6$$

21.



$$y = a(x+2)^2 + 1$$

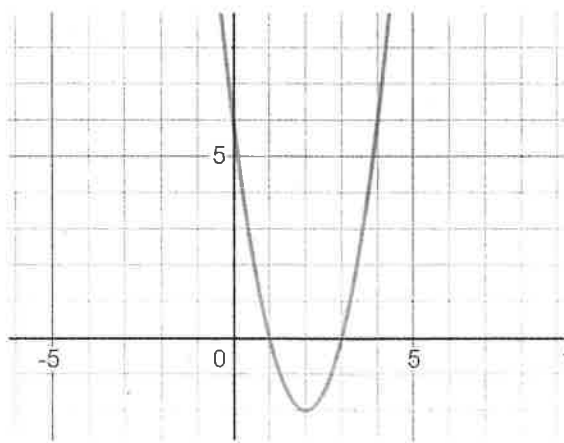
$$3 = a(0+2)^2 + 1$$

$$2 = 4a$$

$$a = \frac{1}{2}$$

$$y = \frac{1}{2}(x+2)^2 + 1$$

22.



$$y = a(x-2)^2 - 2$$

$$0 = a(1-2)^2 - 2$$

$$2 = a$$

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