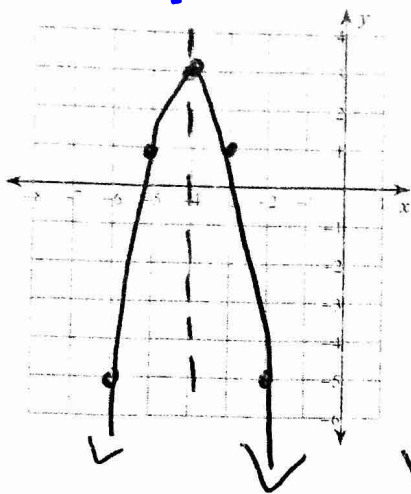


Sketch the graph of each function. Identify the vertex and the axis of symmetry.

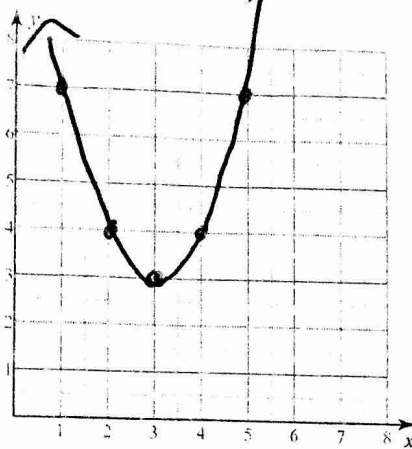
1) $y = -2(x+4)^2 + 3$



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

AOS
 $x = -4$
 vertex $(-4, 3)$

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

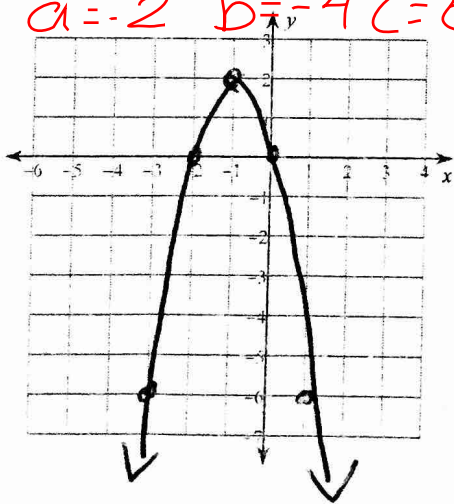


x	y
3	3
4	4
5	7

AOS
 $x = 3$
 vertex $(3, 3)$

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

$a = -2$ $b = -4$ $c = 0$

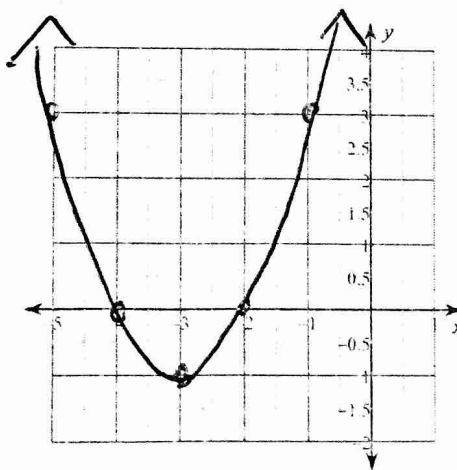


x	y
-1	2
0	0
1	-6

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

AOS $x = -1$
 vertex $(-1, 2)$

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



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

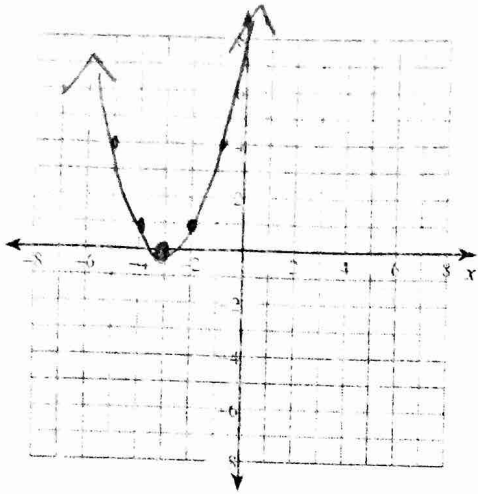
$\frac{-6}{2(1)} = -3$

$x = -3$
 vertex: $(-3, -1)$

Don't graph

Identify the vertex and axis of symmetry of each. Then sketch the graph.

5) $y = x^2 + 6x + 9$



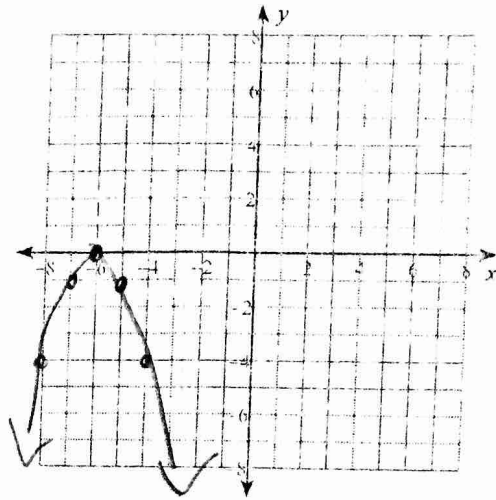
$-3, 0$

$x = -3$

x	y
-3	0
-2	1
-1	4

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

6) $y = -x^2 - 12x - 36$



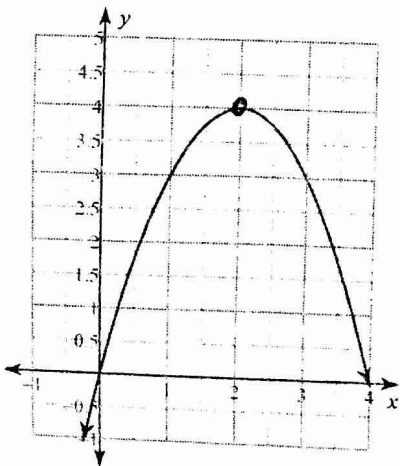
$-6, 0$

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

$\frac{12}{2(-1)} = -6$

Use the information provided to write the vertex form equation of each parabola.

7)

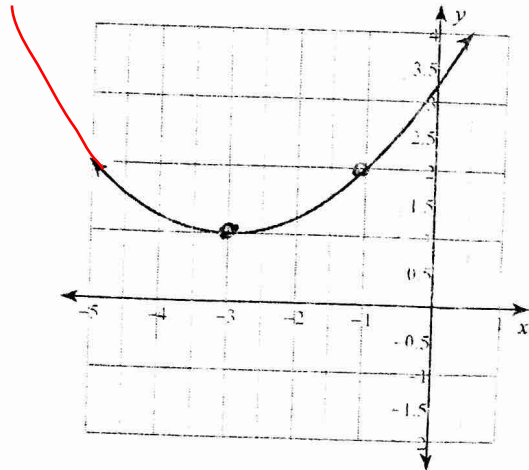


$2, 4$

$a(x-h)^2 + k$

$-(x-2)^2 + 4$

8)

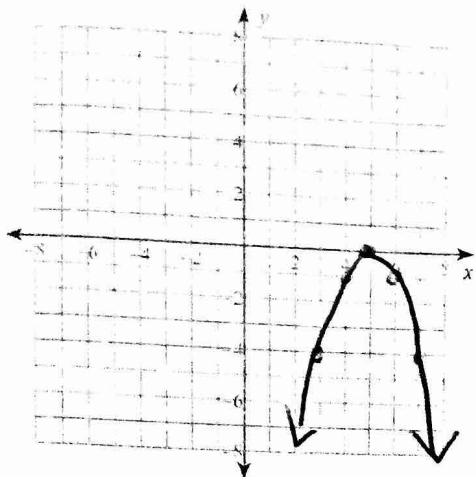


$-3, 1$

$\frac{1}{2}(x+3)^2 + 1$

Identify the vertex and axis of symmetry of each. Then sketch the graph.

9) $y = -(x - 5)^2$

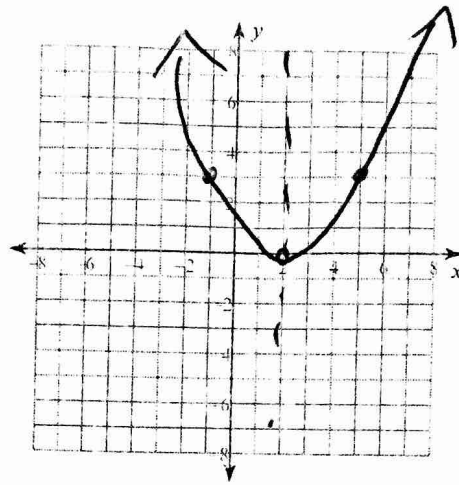


vertex

5, 0

$x = 5$

10) $y = \frac{1}{3}(x - 2)^2$



vertex

(2, 0)

AOS $x = 2$

x	y
2	0
-1	3
-4	12

Describe the Transformation.

11) $y = \frac{1}{2}(x + 4)^2 - 1$

Shrink by $\frac{1}{2}$
left 4
down 1

13) $y = (x - 6)^2 - 2$

Right 6
down 2

12) $y = -\frac{1}{3}(x - 1)^2 - 5$

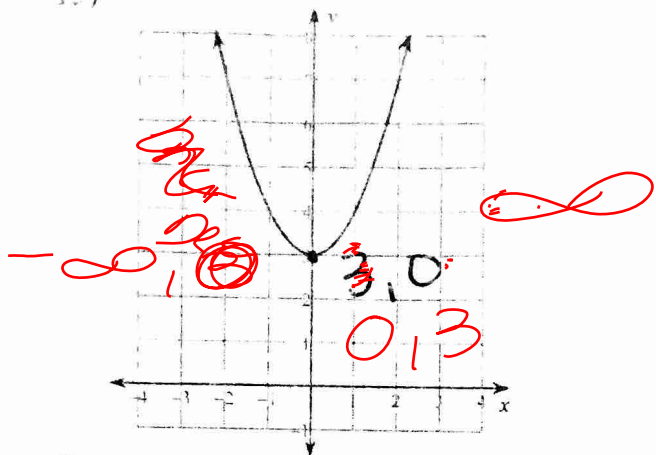
Reflect across the
Right 1
down 5
Shrink by $\frac{1}{3}$

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

Reflect across the
left 1
up 1

Answer the following information given these graphs. Domain, Range, Intercepts, Increase, Decrease, Extrema, and End Behavior.

15)



D: \mathbb{R}

R: $y \geq 3$

Int: none (y-int) = (3, 0)

Increase: (3, ∞)

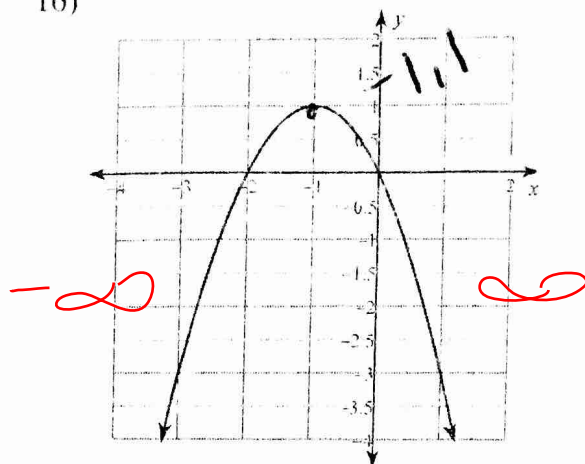
Decrease: ($-\infty$, 3)

Extrema: min (3, 0)

As $x \rightarrow +\infty$, $f(x) \rightarrow +\infty$

As $x \rightarrow -\infty$, $f(x) \rightarrow +\infty$

16)



D: \mathbb{R}

R: $y \leq 1$

Int: x : (-2, 0) + (0, 0) y: (0, 1)

Increase: ($-\infty$, -1)

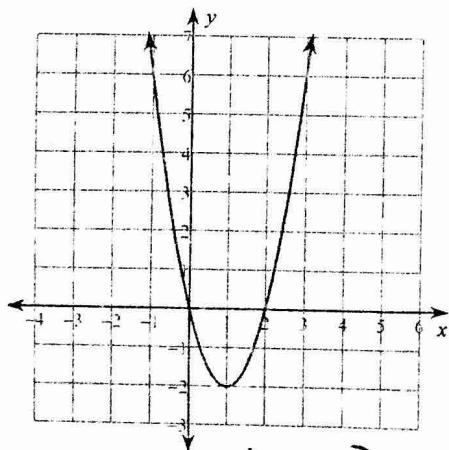
Decrease: (-1, ∞)

Extrema (-1, 1) max

As $x \rightarrow +\infty$, $f(x) \rightarrow -\infty$

As $x \rightarrow -\infty$, $f(x) \rightarrow -\infty$

17)



D: \mathbb{R}

R: $y \geq -2$

Int: (0, 0) $x+y$ x (2, 0)

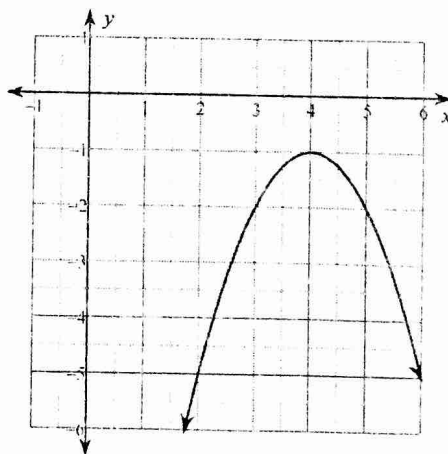
Increase: (1, ∞)

Dec: ($-\infty$, 1)

Ext: min (1, -2)

$+\infty$
 $+\infty$

18)



D: \mathbb{R}

R: $y \leq -1$

none - Int.

Inc: ($-\infty$, 4)

Dec: (4, ∞)

Ext: max (4, -1)

$-\infty$
 $-\infty$