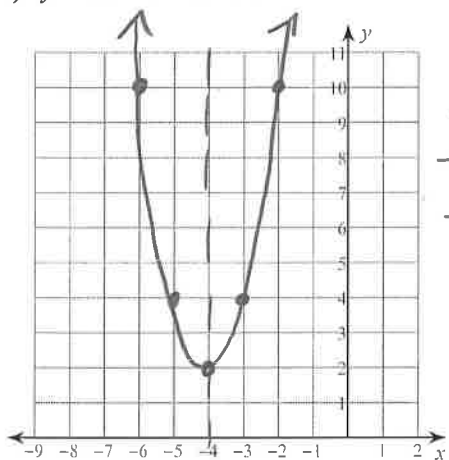


4.7 Practice Problems

Find the vertex then sketch the graph of the function

1)  $y = 2x^2 + 16x + 34$



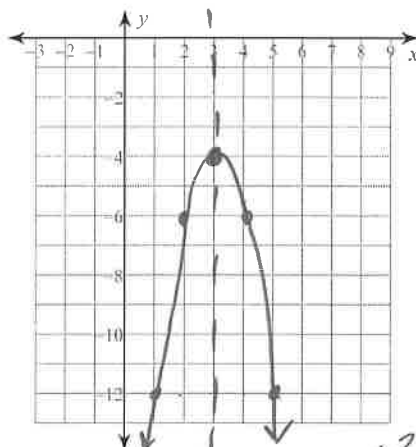
x	y
-4	2
-3	4
-2	10

$$x = \frac{-b}{2a} = \frac{-16}{2(2)} = -4$$

$$y = 2(-4)^2 + 16(-4) + 34 = 2$$

Vertex:  $(-4, 2)$

2)  $y = -2x^2 + 12x - 22$



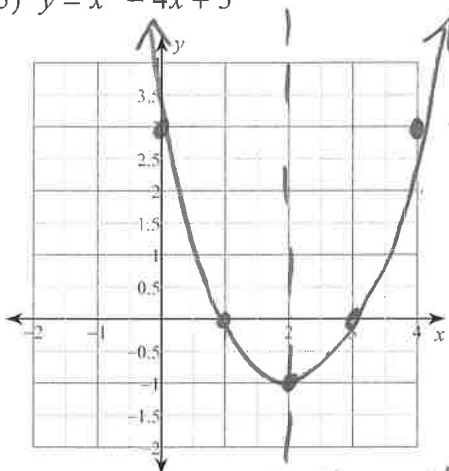
x	y
3	-4
2	-6
1	-12

$$x = \frac{-b}{2a} = \frac{-12}{2(-2)} = \frac{-12}{-4} = 3$$

$$y = -2(3)^2 + 12(3) - 22 = -4$$

Vertex:  $(3, -4)$

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



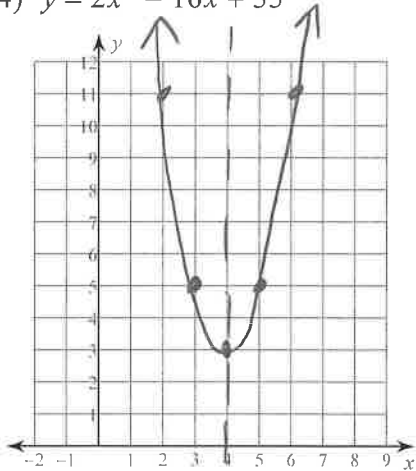
x	y
2	-1
3	0
4	3

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

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

Vertex:  $(2, -1)$

4)  $y = 2x^2 - 16x + 35$



x	y
4	3
3	5
2	11

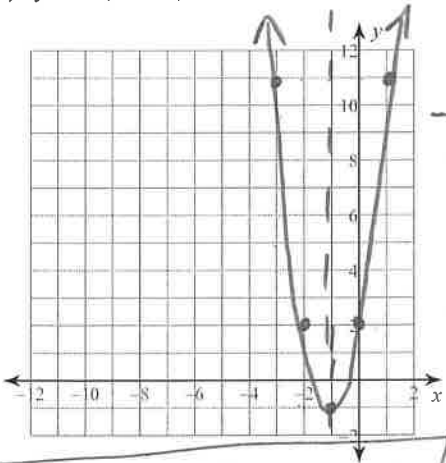
$$x = \frac{-b}{2a} = \frac{-(-16)}{2(2)} = \frac{16}{4} = 4$$

$$y = 2(4)^2 - 16(4) + 35 = 3$$

Vertex:  $(4, 3)$

Identify the vertices then sketch the graph of each function.

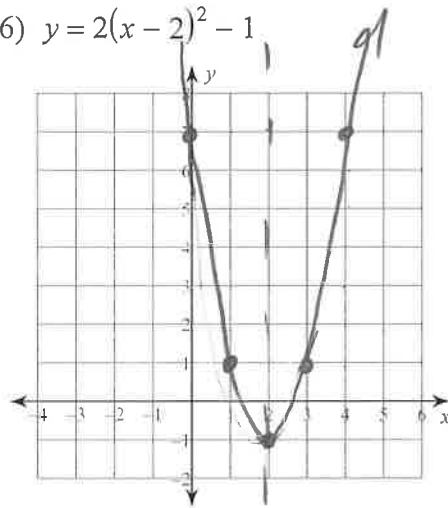
5)  $y = 3(x + 1)^2 - 1$



x	y
-1	-1
0	1
1	1

Vertex:  $(-1, -1)$

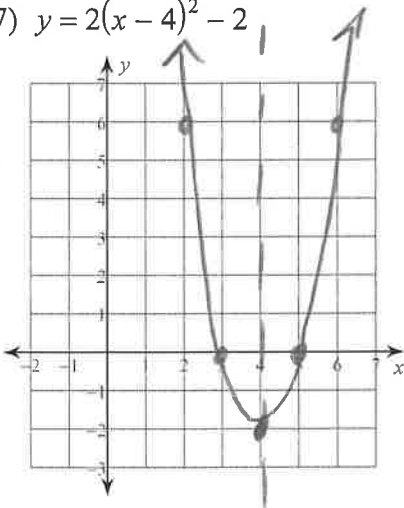
6)  $y = 2(x - 2)^2 - 1$



x	y
2	-1
3	1
4	7

Vertex:  $(2, -1)$

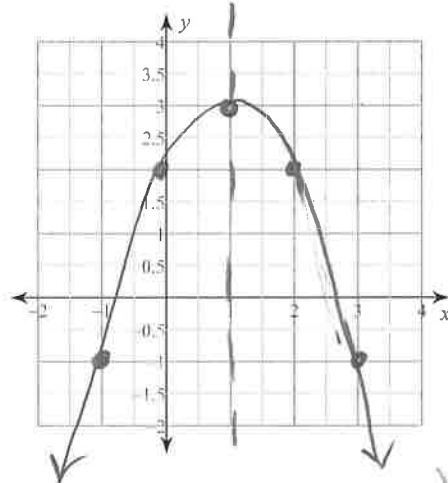
7)  $y = 2(x - 4)^2 - 2$



Vertex:  $(4, -2)$

x	y
4	-2
5	0
6	6

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

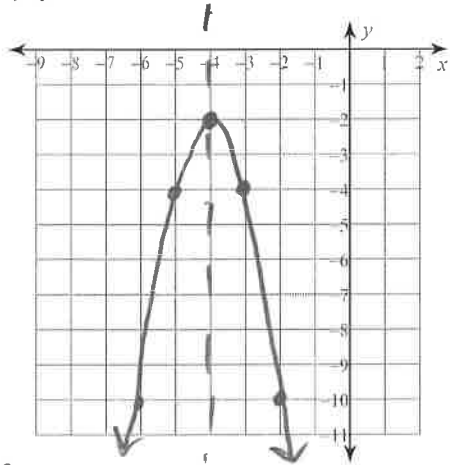


Vertex:  $(1, 3)$

x	y
1	3
2	2
3	-1

Put each of the following in vertex form by completing the square then sketch the graph of each function.

9)  $y = -2x^2 - 16x - 34$

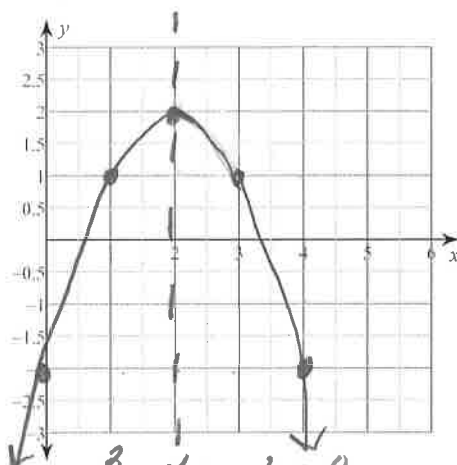


x	y
-4	-2
-3	-4
-2	-10

$$\begin{aligned}
 -2x^2 - 16x - 34 &= 0 \\
 -2x^2 - 16x &= 34 \\
 -2(x^2 + 8x + 16) &= 34 + \underline{-32} \\
 +2(x+4)^2 &= 2 \\
 y &= -2(x+4)^2 - 2
 \end{aligned}$$

Vertex:  $(-4, -2)$

10)  $y = -x^2 + 4x - 2$

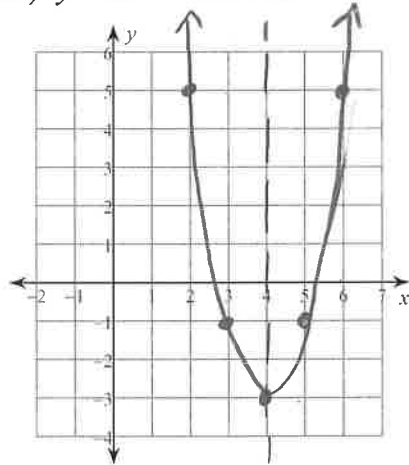


x	y
2	2
3	1
4	-2

$$\begin{aligned}
 -x^2 + 4x - 2 &= 0 \\
 -x^2 + 4x &= 2 \\
 -(x^2 - 4x + 4) &= 2 + \underline{-4} \\
 -(x-2)^2 &= -2 \\
 y &= -(x-2)^2 + 2
 \end{aligned}$$

Vertex  $(2, 2)$

11)  $y = 2x^2 - 16x + 29$

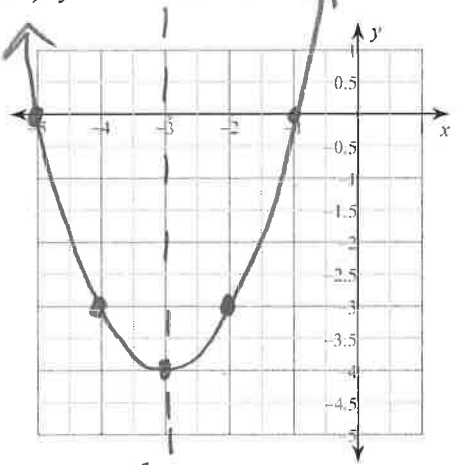


x	y
4	-3
3	-1
2	5

$$\begin{aligned}
 2x^2 - 16x + 29 &= 0 \\
 2x^2 - 16x &= -29 \\
 2(x^2 - 8x + 16) &= -29 + \underline{32} \\
 2(x-4)^2 &= 3 \\
 y &= 2(x-4)^2 - 3
 \end{aligned}$$

Vertex  $(4, -3)$

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



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

$$\begin{aligned}
 x^2 + 6x + 5 &= 0 \\
 x^2 + 6x + 9 &= -5 + \underline{9} \\
 (x+3)^2 &= 4 \\
 y &= (x+3)^2 - 4
 \end{aligned}$$

Vertex  $(-3, -4)$