

Vertex Form of Parabolas

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

1) $y = x^2 + 16x + 71$

$$y = (x + 8)^2 + 7$$

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

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

3) $y = -x^2 - 14x - 59$

$$y = -(x + 7)^2 - 10$$

4) $y = 2x^2 + 36x + 170$

$$y = 2(x + 9)^2 + 8$$

5) $y = x^2 - 12x + 46$

$$y = (x - 6)^2 + 10$$

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

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

7) $y = x^2 - 6x + 5$

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

8) $y = (x + 5)(x + 4)$

$$y = \left(x + \frac{9}{2}\right)^2 - \frac{1}{4}$$

9) $\frac{1}{2}(y + 4) = (x - 7)^2$

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

10) $6x^2 + 12x + y + 13 = 0$

$$y = -6(x + 1)^2 - 7$$

11) $162x + 731 = -y - 9x^2$

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

12) $x^2 - 12x + y + 40 = 0$

$$y = -(x - 6)^2 - 4$$

13) $y = x^2 + 10x + 33$

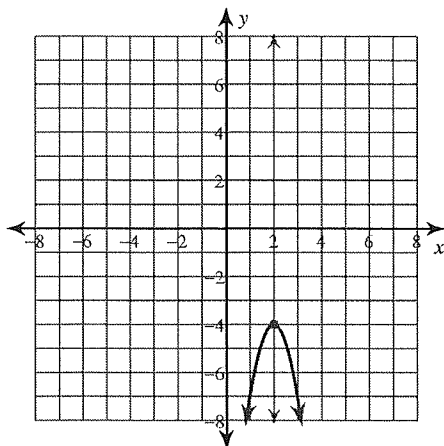
$$y = (x + 5)^2 + 8$$

14) $y + 6 = (x + 3)^2$

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

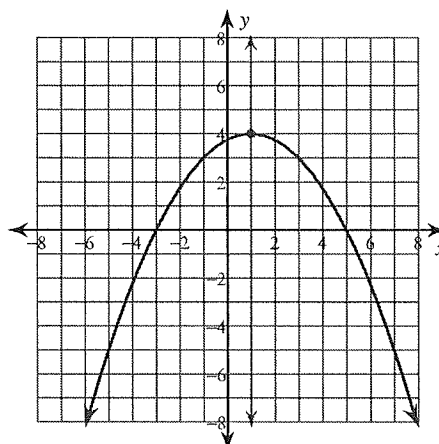
Identify the vertex and axis of symmetry of each. Then sketch the graph.

15) $f(x) = -3(x-2)^2 - 4$



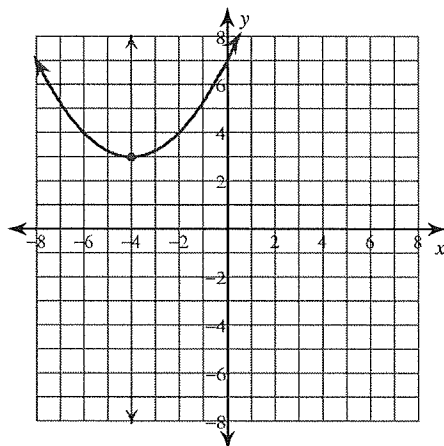
Vertex: (2, -4)
Axis of Sym.: $x = 2$

16) $f(x) = -\frac{1}{4}(x-1)^2 + 4$



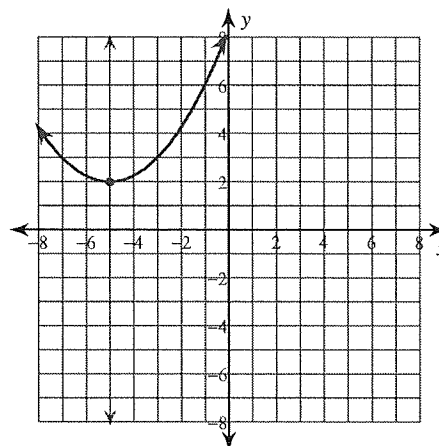
Vertex: (1, 4)
Axis of Sym.: $x = 1$

17) $f(x) = \frac{1}{4}(x+4)^2 + 3$



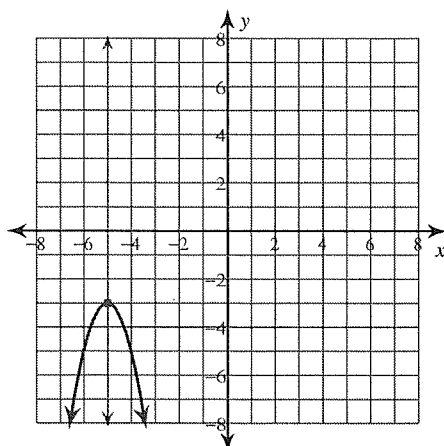
Vertex: (-4, 3)
Axis of Sym.: $x = -4$

18) $f(x) = \frac{1}{4}(x+5)^2 + 2$



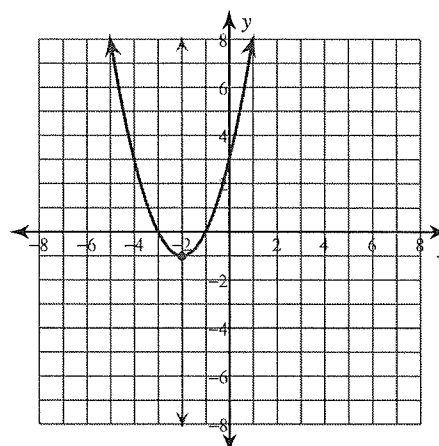
Vertex: (-5, 2)
Axis of Sym.: $x = -5$

19) $f(x) = -2(x+5)^2 - 3$



Vertex: (-5, -3)
Axis of Sym.: $x = -5$

20) $f(x) = (x+2)^2 - 1$



Vertex: (-2, -1)
Axis of Sym.: $x = -2$