

Writing Equations of Parabolas

Date _____ Period _____

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

1) Vertex at origin, Focus: $\left(0, -\frac{1}{32}\right)$

2) Vertex at origin, Focus: $\left(0, \frac{1}{8}\right)$

3) Vertex at origin, Directrix: $y = \frac{1}{4}$

4) Vertex at origin, Directrix: $y = -\frac{1}{8}$

5) Vertex: $(-5, 8)$, Focus: $\left(-\frac{21}{4}, 8\right)$

6) Vertex: $(-8, -9)$, Focus: $\left(-\frac{31}{4}, -9\right)$

7) Vertex: $(-6, -9)$, Directrix: $x = -\frac{47}{8}$

8) Vertex: $(8, 9)$, Directrix: $y = \frac{73}{8}$

9) Vertex: $(8, -1)$, y-intercept: -17

10) Vertex: $(5, -1)$, y-intercept: $-\frac{27}{2}$

11) Opens left or right, Vertex: $(7, 6)$, Passes through: $(-11, 9)$

12) Opens left or right, Vertex: $(7, 0)$, Passes through: $(6, -1)$

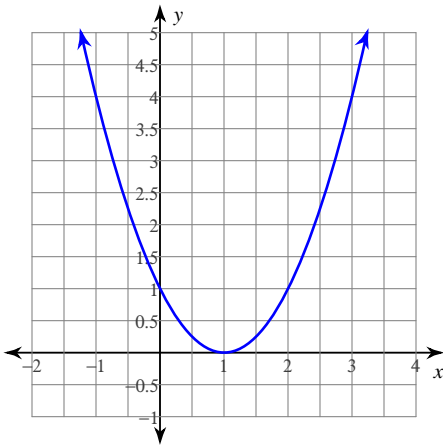
13) Focus: $\left(-\frac{63}{8}, -7\right)$, Directrix: $x = -\frac{65}{8}$

14) Focus: $\left(\frac{107}{12}, -7\right)$, Directrix: $x = \frac{109}{12}$

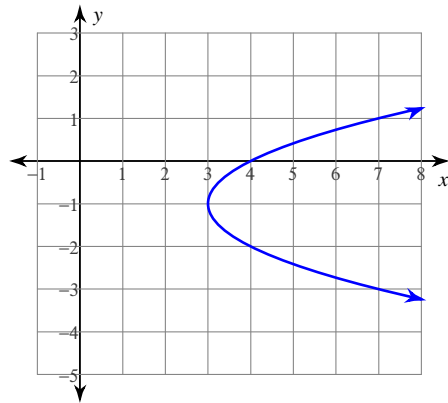
- 15) Opens up or down, and passes through $(-6, -7)$, $(-11, -2)$, and $(-8, 1)$

- 16) Opens up or down, and passes through $(11, 15)$, $(7, 7)$, and $(4, 22)$

17)



18)



- 19) Vertex at origin, opens left,
 $\frac{1}{8}$ units between the vertex and focus

- 20) Vertex at origin, opens right,
 $\frac{1}{8}$ units between the vertex and focus

- 21) Vertex: $(10, 0)$, axis of symmetry: $y = 0$,
length of latus rectum = 1, $a < 0$

- 22) Vertex: $(4, 2)$, axis of symmetry: $x = 4$,
length of latus rectum = $\frac{1}{3}$, $a > 0$

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

23) $x^2 + 3x + y - 28 = 0$

24) $-y^2 + x - 20y - 103 = 0$

Writing Equations of Parabolas

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

1) Vertex at origin, Focus: $\left(0, -\frac{1}{32}\right)$

$$y = -8x^2$$

2) Vertex at origin, Focus: $\left(0, \frac{1}{8}\right)$

$$y = 2x^2$$

3) Vertex at origin, Directrix: $y = \frac{1}{4}$

$$y = -x^2$$

4) Vertex at origin, Directrix: $y = -\frac{1}{8}$

$$y = 2x^2$$

5) Vertex: $(-5, 8)$, Focus: $\left(-\frac{21}{4}, 8\right)$

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

6) Vertex: $(-8, -9)$, Focus: $\left(-\frac{31}{4}, -9\right)$

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

7) Vertex: $(-6, -9)$, Directrix: $x = -\frac{47}{8}$

$$x = -2(y + 9)^2 - 6$$

8) Vertex: $(8, 9)$, Directrix: $y = \frac{73}{8}$

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

9) Vertex: $(8, -1)$, y-intercept: -17

$$y = -\frac{1}{4}(x - 8)^2 - 1$$

10) Vertex: $(5, -1)$, y-intercept: $-\frac{27}{2}$

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

11) Opens left or right, Vertex: $(7, 6)$, Passes through: $(-11, 9)$

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

12) Opens left or right, Vertex: $(7, 0)$, Passes through: $(6, -1)$

$$x = -y^2 + 7$$

13) Focus: $\left(-\frac{63}{8}, -7\right)$, Directrix: $x = -\frac{65}{8}$

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

14) Focus: $\left(\frac{107}{12}, -7\right)$, Directrix: $x = \frac{109}{12}$

$$x = -3(y + 7)^2 + 9$$

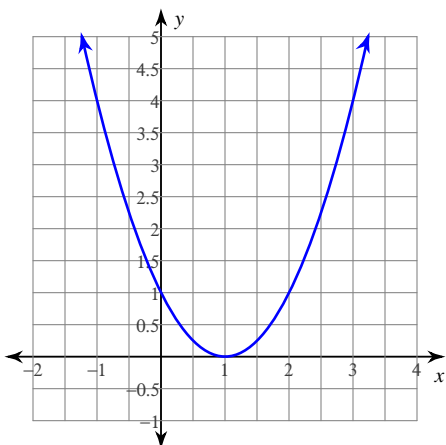
- 15) Opens up or down, and passes through $(-6, -7)$, $(-11, -2)$, and $(-8, 1)$

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

- 16) Opens up or down, and passes through $(11, 15)$, $(7, 7)$, and $(4, 22)$

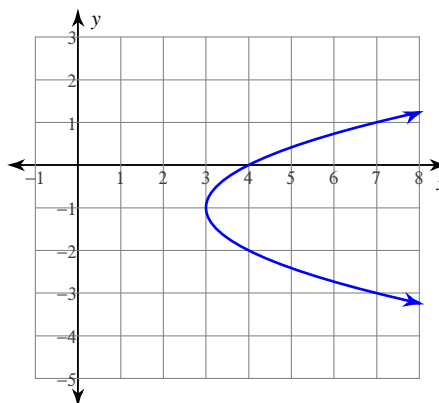
$$y = (x - 8)^2 + 6$$

17)



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

18)



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

- 19) Vertex at origin, opens left,
 $\frac{1}{8}$ units between the vertex and focus

$$x = -2y^2$$

- 20) Vertex at origin, opens right,
 $\frac{1}{8}$ units between the vertex and focus

$$x = 2y^2$$

- 21) Vertex: $(10, 0)$, axis of symmetry: $y = 0$,
length of latus rectum = 1, $a < 0$

$$x = y^2 + 10$$

- 22) Vertex: $(4, 2)$, axis of symmetry: $x = 4$,
length of latus rectum = $\frac{1}{3}$, $a > 0$

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

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

23) $x^2 + 3x + y - 28 = 0$

$$y = -(x + 7)(x - 4)$$

24) $-y^2 + x - 20y - 103 = 0$

$$x = y^2 + 20y + 103$$