

HW textbook p. 720

1. Center: (0, 0)

$$a = 3, b = 5, c = \sqrt{34}$$

Vertical transverse axis

Matches graph (b).

2. Center: (0, 0)

$$a = 5, b = 3$$

Vertical transverse axis

Matches graph (c)

3. Center: (1, 0)

$$a = 4, b = 2$$

Horizontal transverse axis

Matches graph (a).

4. Center: (-1, 2)

$$a = 4, b = 3$$

Horizontal transverse axis

Matches graph (d)

6. $\frac{x^2}{9} - \frac{y^2}{25} = 1$

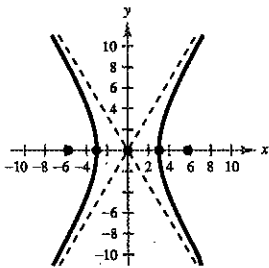
Center: (0, 0)

$$a = 3, b = 5, c = \sqrt{3^2 + 5^2} = \sqrt{34}$$

Vertices: $(\pm 3, 0)$

Foci: $(\pm \sqrt{34}, 0)$

Asymptotes: $y = \pm \frac{b}{a}x = \pm \frac{5}{3}x$



9. $\frac{y^2}{25} - \frac{x^2}{81} = 1$

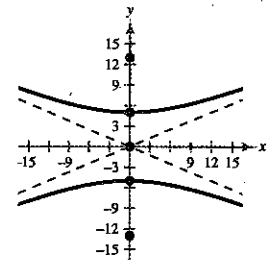
$$a = 5, b = 9, c = \sqrt{a^2 + b^2} = \sqrt{106}$$

Center: (0, 0)

Vertices: $(0, \pm 5)$

Foci: $(0, \pm \sqrt{106})$

Asymptotes: $y = \pm \frac{a}{b}x = \pm \frac{5}{9}x$



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

$$a = 2, b = 1, c = \sqrt{5}$$

Center: (1, -2)

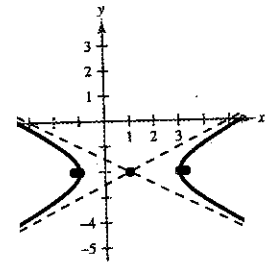
Vertices: $(-1, -2), (3, -2)$

Foci: $(1 \pm \sqrt{5}, -2)$

Asymptotes:

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

$$y = -\frac{1}{2}x - \frac{3}{2}$$



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

$$a = 1, b = 1, c = \sqrt{2}$$

Center: (2, -6)

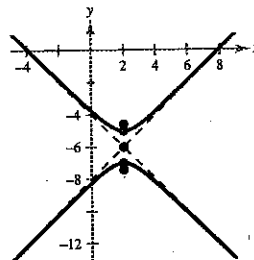
Vertices: $(2, -5), (2, -7)$

Foci: $(2, -6 \pm \sqrt{2})$

Asymptotes:

$$y = x - 8$$

$$y = -x - 4$$



23. Vertices: $(0, \pm 2) \Rightarrow a = 2$

Foci: $(0, \pm 4) \Rightarrow c = 4$

$$b^2 = c^2 - a^2 = 16 - 4 = 12$$

Center: $(0, 0) = (h, k)$

$$\frac{(y - k)^2}{a^2} - \frac{(x - h)^2}{b^2} = 1$$

$$\frac{y^2}{4} - \frac{x^2}{12} = 1$$

30. Vertices: $(2, 3), (2, -3) \Rightarrow a = 3$

Center: $(2, 0)$

Foci: $(2, 5), (2, -5) \Rightarrow c = 5$

$$b^2 = c^2 - a^2 = 25 - 9 = 16$$

$$\frac{(y - k)^2}{a^2} - \frac{(x - h)^2}{b^2} = 1$$

$$\frac{y^2}{9} - \frac{(x - 2)^2}{16} = 1$$

25. Vertices: $(\pm 1, 0) \Rightarrow a = 1$

Asymptotes: $y = \pm 5x \Rightarrow \frac{b}{a} = 5 \Rightarrow b = 5$

Center: $(0, 0)$

$$\frac{x^2}{1} - \frac{y^2}{25} = 1$$

32. Vertices: $(-2, 1), (2, 1) \Rightarrow a = 2$

Center: $(0, 1)$

Foci: $(-3, 1), (3, 1) \Rightarrow c = 3$

$$b^2 = c^2 - a^2 = 9 - 4 = 5$$

$$\frac{(x - h)^2}{a^2} - \frac{(y - k)^2}{b^2} = 1$$

$$\frac{x^2}{4} - \frac{(y - 1)^2}{5} = 1$$