

HW Answers textbook p. 710 - 711

$$1. \frac{x^2}{4} + \frac{y^2}{9} = 1$$

Center: (0, 0)

$a = 3, b = 2$

Vertical major axis

Matches graph (b).

$$3. \frac{x^2}{4} + \frac{y^2}{25} = 1$$

Center: (0, 0)

$a = 5, b = 2$

Vertical major axis

Matches graph (d).

$$5. \frac{(x-2)^2}{16} + (y+1)^2 = 1$$

Center: (2, -1)

$a = 4, b = 1$

Horizontal major axis

Matches graph (a).

$$2. \frac{x^2}{9} + \frac{y^2}{4} = 1$$

Center: (0, 0)

$a = 3, b = 2$

Horizontal major axis

Matches graph (c).

$$4. \frac{y^2}{4} + \frac{x^2}{4} = 1$$

Center: (0, 0)

Circle of radius: 2

Matches graph (f).

$$6. \frac{(x+2)^2}{9} + \frac{(y+2)^2}{4} = 1$$

Center: (-2, -2)

Horizontal major axis

Matches graph (e).

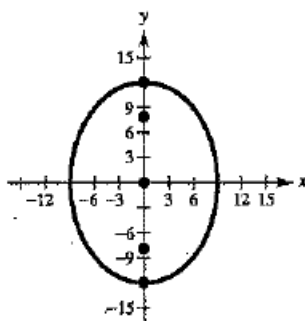
$$8. \frac{x^2}{81} + \frac{y^2}{144} = 1$$

Center: (0, 0)

$a = 12, b = 9, c = \sqrt{144 - 81} = \sqrt{63} = 3\sqrt{7}$

Foci: $(0, \pm 3\sqrt{7})$

Vertices: $(0, \pm 12)$



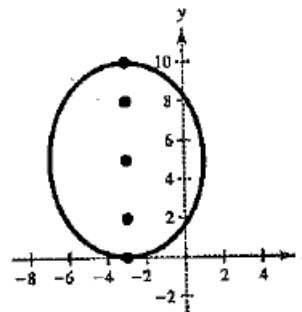
$$11. \frac{(x+3)^2}{16} + \frac{(y-5)^2}{25} = 1$$

Center: (-3, 5)

$a = 5, b = 4, c = 3$

Foci: $(-3, 5 \pm 3) = (-3, 8), (-3, 2)$

Vertices: $(-3, 5 \pm 5) = (-3, 10), (-3, 0)$



27. Center: $(0, 0)$, $a = 4$, $b = 2$

$$\frac{x^2}{4} + \frac{y^2}{16} = 1$$

31. Foci: $(\pm 5, 0) \Rightarrow c = 5$

Center: $(0, 0)$

Horizontal major axis

Major axis of length 12 $\Rightarrow 2a = 12$

$$a = 6$$

$$6^2 - b^2 = 5^2 \Rightarrow b^2 = 11$$

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

$$\frac{x^2}{36} + \frac{y^2}{11} = 1$$

35. Center: $(2, 3)$

$$a = 3, \quad b = 1$$

Vertical major axis

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

$$\frac{(x - 2)^2}{1} + \frac{(y - 3)^2}{9} = 1$$

30. Vertices: $(0, \pm 8) \Rightarrow a = 8$

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

$$b^2 = a^2 - c^2 = 64 - 16 = 48$$

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

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

$$\frac{y^2}{64} + \frac{x^2}{48} = 1$$

37. Center: $(-2, 3)$, $a = 4$, $b = 3$

$$\frac{(x + 2)^2}{16} + \frac{(y - 3)^2}{9} = 1$$