

## Writing Equations of Ellipses

Use the information provided to write the standard form equation of each ellipse.

- 1) Vertices:  $(10, 0)$ ,  $(-10, 0)$   
Co-vertices:  $(0, 9)$ ,  $(0, -9)$
- 2) Vertices:  $(0, 6)$ ,  $(0, -6)$   
Co-vertices:  $(5, 0)$ ,  $(-5, 0)$
- 3) Vertices:  $(12, 0)$ ,  $(-12, 0)$   
Foci:  $(2\sqrt{11}, 0)$ ,  $(-2\sqrt{11}, 0)$
- 4) Vertices:  $(14, 0)$ ,  $(-14, 0)$   
Foci:  $(3\sqrt{19}, 0)$ ,  $(-3\sqrt{19}, 0)$
- 5) Foci:  $(-7, 5 + \sqrt{13})$ ,  $(-7, 5 - \sqrt{13})$   
Co-vertices:  $(-1, 5)$ ,  $(-13, 5)$
- 6) Foci:  $(7, 9)$ ,  $(-1, 9)$   
Co-vertices:  $(3, 12)$ ,  $(3, 6)$
- 7) Foci:  $(\sqrt{17}, 0)$ ,  $(-\sqrt{17}, 0)$   
Endpoints of major axis:  $(9, 0)$ ,  $(-9, 0)$
- 8) Foci:  $(\sqrt{115}, 0)$ ,  $(-\sqrt{115}, 0)$   
Endpoints of major axis:  $(\sqrt{195}, 0)$ ,  $(-\sqrt{195}, 0)$
- 9) Foci:  $(7 + 2\sqrt{35}, -4)$ ,  $(7 - 2\sqrt{35}, -4)$   
Endpoints of minor axis:  $(7, -2)$ ,  $(7, -6)$
- 10) Foci:  $(-5, 7 + \sqrt{115})$ ,  $(-5, 7 - \sqrt{115})$   
Endpoints of minor axis:  $(4, 7)$ ,  $(-14, 7)$
- 11) Center:  $(6, -5)$   
Vertex:  $(6, 7)$   
Focus:  $(6, -5 - 6\sqrt{3})$
- 12) Center:  $(-3, -4)$   
Vertex:  $(6, -4)$   
Focus:  $(-3 - \sqrt{65}, -4)$
- 13) Center:  $(4, 8)$   
Vertex:  $(4, 8 - \sqrt{170})$   
Co-vertex:  $(4 - \sqrt{15}, 8)$
- 14) Center:  $(7, -10)$   
Vertex:  $(-6, -10)$   
Co-vertex:  $(7, -17)$

15) Center:  $(-3, 3)$   
 Vertex:  $(-10, 3)$   
 $c^2 = 33$

16) Center:  $(1, -7)$   
 Vertex:  $(1, 1)$   
 $c^2 = 55$

17) Center:  $(-9, 5)$   
 Focus:  $(-9 + 2\sqrt{14}, 5)$   
 Co-vertex:  $(-9, 10)$

18) Center:  $(6, -4)$   
 Focus:  $(6 + 2\sqrt{6}, -4)$   
 Co-vertex:  $(6, 1)$

19) Center:  $(4, 0)$   
 Focus:  $(4, 3\sqrt{7})$   
 Width: 18

20) Center:  $(4, -8)$   
 Height: 18  
 Width: 14

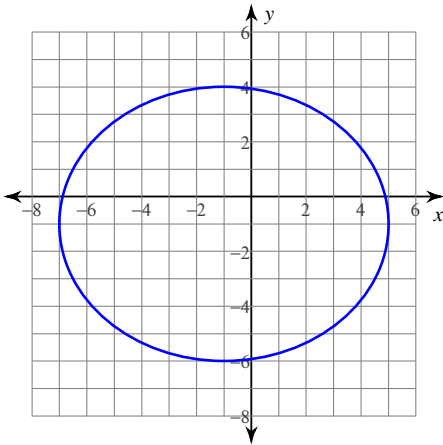
21) Center:  $(9, -7)$   
 $a = 9$   
 $b = 4$   
 Width: 8

22) Center at origin  
 Focus:  $(3\sqrt{15}, 0)$   
 y-intercept:  $(0, 3)$

23) Endpoints of major axis:  $(4, 18), (4, -4)$   
 Endpoints of minor axis:  $(12, 7), (-4, 7)$

24) Major axis is vertical  
 Center:  $(8, -2)$   
 Major axis is 18 units long  
 Minor axis is 8 units long

25)



26) Eccentricity =  $\frac{\sqrt{91}}{10}$   
 Co-vertices:  $(12, 1), (6, 1)$

## Writing Equations of Ellipses

Use the information provided to write the standard form equation of each ellipse.

- 1) Vertices: (10, 0), (-10, 0)  
Co-vertices: (0, 9), (0, -9)

$$\frac{x^2}{100} + \frac{y^2}{81} = 1$$

- 2) Vertices: (0, 6), (0, -6)  
Co-vertices: (5, 0), (-5, 0)

$$\frac{x^2}{25} + \frac{y^2}{36} = 1$$

- 3) Vertices: (12, 0), (-12, 0)  
Foci: (2√11, 0), (-2√11, 0)

$$\frac{x^2}{144} + \frac{y^2}{100} = 1$$

- 4) Vertices: (14, 0), (-14, 0)  
Foci: (3√19, 0), (-3√19, 0)

$$\frac{x^2}{196} + \frac{y^2}{25} = 1$$

- 5) Foci: (-7, 5 + √13), (-7, 5 - √13)  
Co-vertices: (-1, 5), (-13, 5)

$$\frac{(x+7)^2}{36} + \frac{(y-5)^2}{49} = 1$$

- 6) Foci: (7, 9), (-1, 9)  
Co-vertices: (3, 12), (3, 6)

$$\frac{(x-3)^2}{25} + \frac{(y-9)^2}{9} = 1$$

- 7) Foci: (√17, 0), (-√17, 0)  
Endpoints of major axis: (9, 0), (-9, 0)

$$\frac{x^2}{81} + \frac{y^2}{64} = 1$$

- 8) Foci: (√115, 0), (-√115, 0)  
Endpoints of major axis: (√195, 0), (-√195, 0)

$$\frac{x^2}{195} + \frac{y^2}{80} = 1$$

- 9) Foci: (7 + 2√35, -4), (7 - 2√35, -4)  
Endpoints of minor axis: (7, -2), (7, -6)

$$\frac{(x-7)^2}{144} + \frac{(y+4)^2}{4} = 1$$

- 10) Foci: (-5, 7 + √115), (-5, 7 - √115)  
Endpoints of minor axis: (4, 7), (-14, 7)

$$\frac{(x+5)^2}{81} + \frac{(y-7)^2}{196} = 1$$

- 11) Center: (6, -5)  
Vertex: (6, 7)  
Focus: (6, -5 - 6√3)

$$\frac{(x-6)^2}{36} + \frac{(y+5)^2}{144} = 1$$

- 12) Center: (-3, -4)  
Vertex: (6, -4)  
Focus: (-3 - √65, -4)

$$\frac{(x+3)^2}{81} + \frac{(y+4)^2}{16} = 1$$

- 13) Center: (4, 8)  
Vertex: (4, 8 - √170)  
Co-vertex: (4 - √15, 8)

$$\frac{(x-4)^2}{15} + \frac{(y-8)^2}{170} = 1$$

- 14) Center: (7, -10)  
Vertex: (-6, -10)  
Co-vertex: (7, -17)

$$\frac{(x-7)^2}{169} + \frac{(y+10)^2}{49} = 1$$

15) Center:  $(-3, 3)$

Vertex:  $(-10, 3)$

$$c^2 = 33$$

$$\frac{(x+3)^2}{49} + \frac{(y-3)^2}{16} = 1$$

17) Center:  $(-9, 5)$

Focus:  $(-9 + 2\sqrt{14}, 5)$

Co-vertex:  $(-9, 10)$

$$\frac{(x+9)^2}{81} + \frac{(y-5)^2}{25} = 1$$

19) Center:  $(4, 0)$

Focus:  $(4, 3\sqrt{7})$

Width: 18

$$\frac{(x-4)^2}{81} + \frac{y^2}{144} = 1$$

21) Center:  $(9, -7)$

$a = 9$

$b = 4$

Width: 8

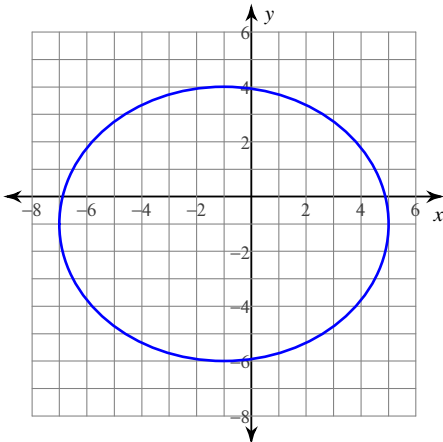
$$\frac{(x-9)^2}{16} + \frac{(y+7)^2}{81} = 1$$

23) Endpoints of major axis:  $(4, 18), (4, -4)$

Endpoints of minor axis:  $(12, 7), (-4, 7)$

$$\frac{(x-4)^2}{64} + \frac{(y-7)^2}{121} = 1$$

25)



$$\frac{(x+1)^2}{36} + \frac{(y+1)^2}{25} = 1$$

16) Center:  $(1, -7)$

Vertex:  $(1, 1)$

$$c^2 = 55$$

$$\frac{(x-1)^2}{9} + \frac{(y+7)^2}{64} = 1$$

18) Center:  $(6, -4)$

Focus:  $(6 + 2\sqrt{6}, -4)$

Co-vertex:  $(6, 1)$

$$\frac{(x-6)^2}{49} + \frac{(y+4)^2}{25} = 1$$

20) Center:  $(4, -8)$

Height: 18

Width: 14

$$\frac{(x-4)^2}{49} + \frac{(y+8)^2}{81} = 1$$

22) Center at origin

Focus:  $(3\sqrt{15}, 0)$

y-intercept:  $(0, 3)$

$$\frac{x^2}{144} + \frac{y^2}{9} = 1$$

24) Major axis is vertical

Center:  $(8, -2)$

Major axis is 18 units long

Minor axis is 8 units long

$$\frac{(x-8)^2}{16} + \frac{(y+2)^2}{81} = 1$$

26) Eccentricity =  $\frac{\sqrt{91}}{10}$

Co-vertices:  $(12, 1), (6, 1)$

$$\frac{(x-9)^2}{9} + \frac{(y-1)^2}{100} = 1$$