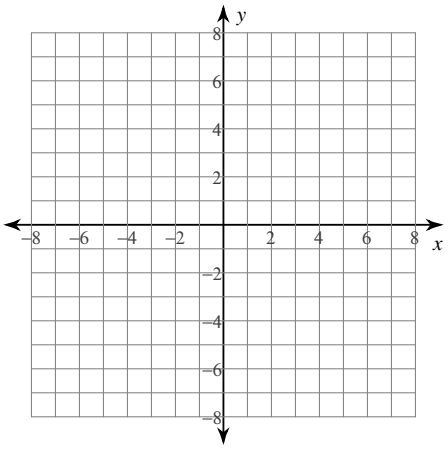
Algebra 2: Assignment #:_____ Name_____

10.4: Ellipses

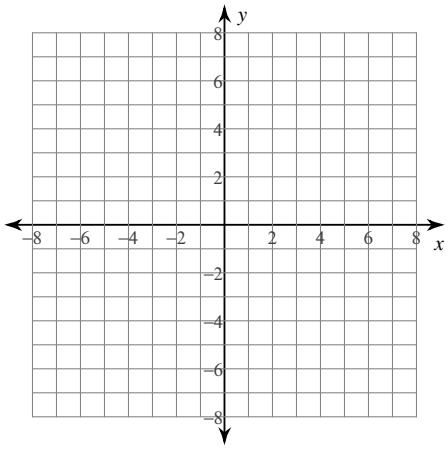
Date_____ Period____

Identify the center, vertices, co-vertices, and foci of each. Then sketch the graph.

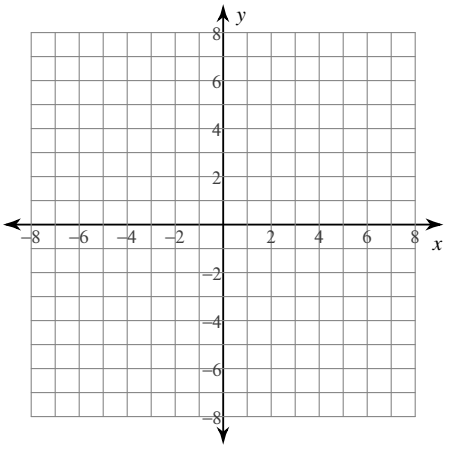
1) $\frac{x^2}{9} + \frac{y^2}{25} = 1$



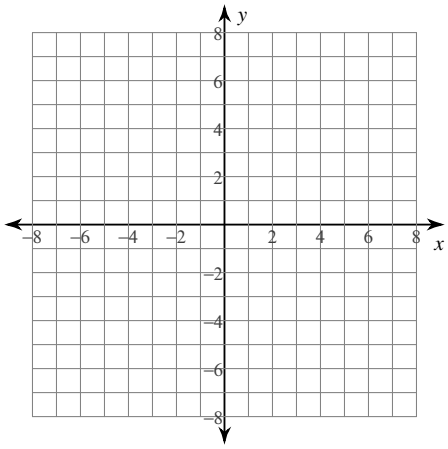
2) $\frac{x^2}{25} + \frac{y^2}{9} = 1$



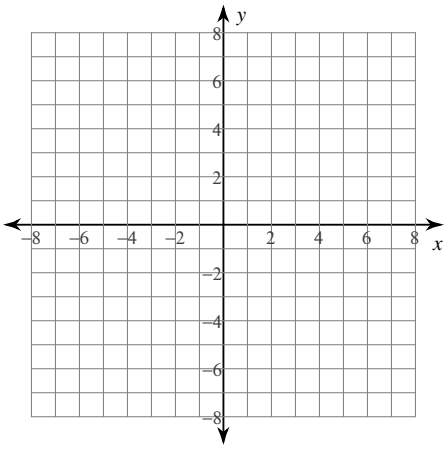
3) $x^2 + \frac{y^2}{4} = 1$



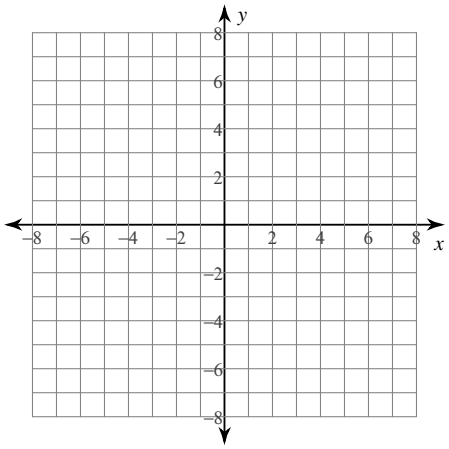
4) $\frac{x^2}{16} + \frac{y^2}{9} = 1$



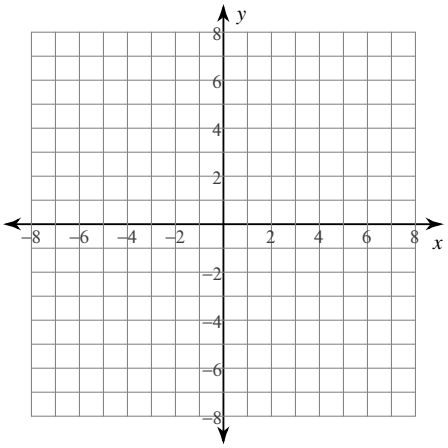
5) $\frac{(x-2)^2}{9}+\frac{(y-1)^2}{25}=1$



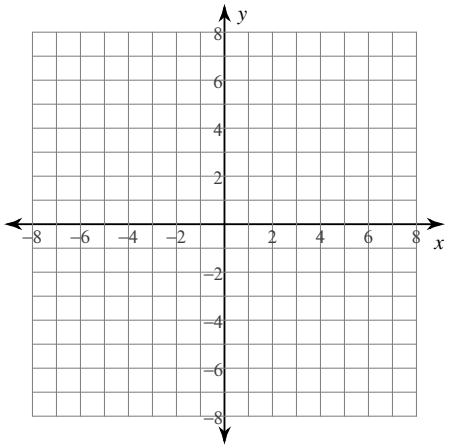
6) $\frac{(x-1)^2}{25}+\frac{(y+4)^2}{9}=1$



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



8) $\frac{x^2}{16}+\frac{(y+1)^2}{25}=1$



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

9) Vertices: $(-3, 12), (-3, 2)$
Foci: $(-3, 10), (-3, 4)$

10) Vertices: $(-6, 12), (-6, 2)$
Foci: $(-6, 10), (-6, 4)$

11) Vertices: $(-3, 11), (-3, -15)$
Foci: $(-3, 10), (-3, -14)$

12) Vertices: $(1, 12), (1, -14)$
Foci: $(1, 4), (1, -6)$

13) Vertices: $(-2, 11), (-2, -19)$
Co-vertices: $(5, -4), (-9, -4)$

14) Vertices: $(7, 6), (7, -8)$
Co-vertices: $(12, -1), (2, -1)$

15) Vertices: $(-10, 10), (-10, -6)$
Co-vertices: $(-6, 2), (-14, 2)$

16) Vertices: $(3, 12), (3, -12)$
Co-vertices: $(8, 0), (-2, 0)$

17) Foci: $(22, -3), (-2, -3)$
Co-vertices: $(10, 2), (10, -8)$

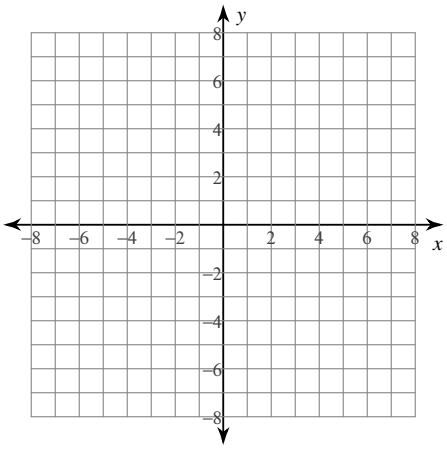
18) Foci: $(6, 9), (6, -15)$
Co-vertices: $(11, -3), (1, -3)$

19) Foci: $(10, -3), (2, -3)$
Co-vertices: $(6, 0), (6, -6)$

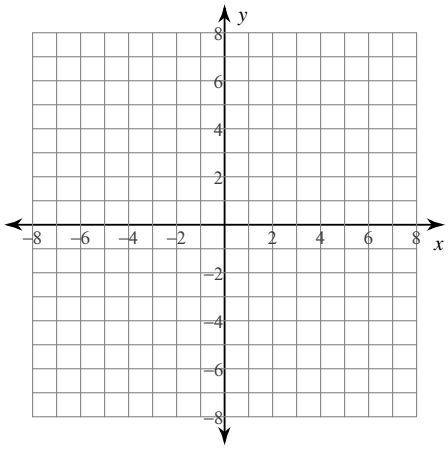
20) Foci: $(12, 9), (6, 9)$
Co-vertices: $(9, 13), (9, 5)$

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

21) $4(y+2) = (x+4)^2$



22) $4(y-2) = (x-5)^2$



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

23) Vertex: $(5, 5)$, Focus: $(4, 5)$

24) Vertex: $(-9, -5)$, Focus: $(-9, -4)$

25) Vertex: $(10, -3)$, Directrix: $y = -2$

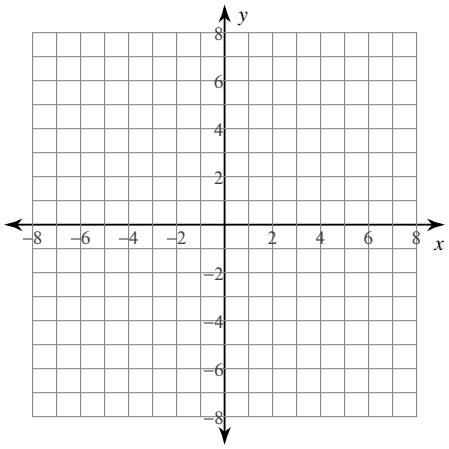
26) Vertex: $(-2, 4)$, Directrix: $x = -1$

27) Focus: $(-8, 10)$, Directrix: $x = -6$

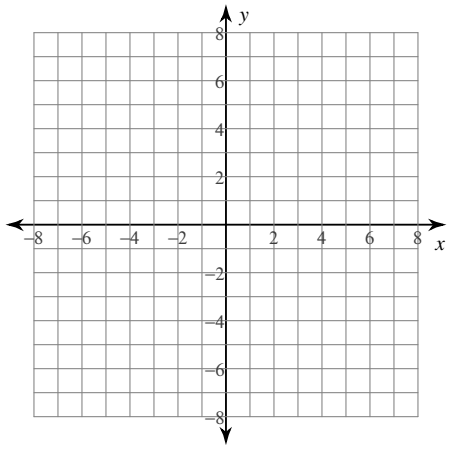
28) Focus: $(3, 8)$, Directrix: $x = 5$

Identify the center and radius of each. Then sketch the graph.

29) $(x+3)^2+(y+2)^2=9$



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



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

31) Center: $(-3, -11)$
Radius: 5

32) Center: $(7, 11)$
Radius: 7

33) Center: $(15, -7)$
Point on Circle: $(19, -7)$

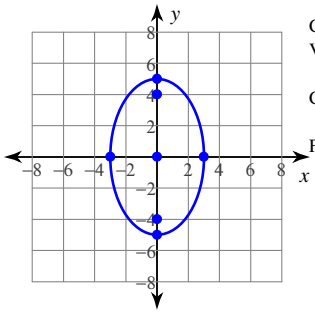
34) Center: $(12, -2)$
Point on Circle: $(10, 0)$

35) Write an equation of the line that is tangent to the circle at that point.
$x^2 + y^2 = 65$; (-8, 1)

36) Write an equation of the line that is tangent to the circle at that point.
$x^2 + y^2 = 40$; (-2, 6)

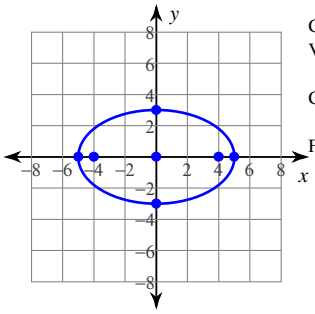
Answers to 10.4: Ellipses (ID: 1)

1)



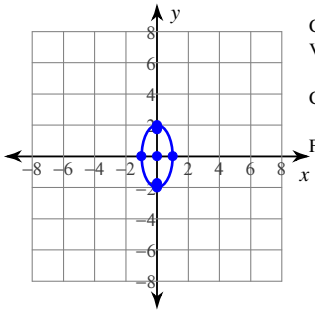
Center: (0, 0)
Vertices: (0, 5)
(0, −5)
Co-vertices: (3, 0)
(−3, 0)
Foci: (0, 4)
(0, −4)

2)



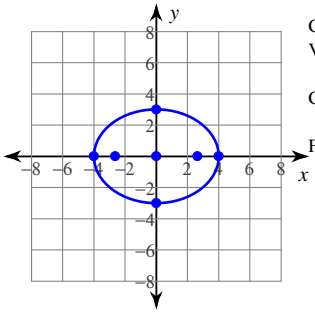
Center: (0, 0)
Vertices: (5, 0)
(−5, 0)
Co-vertices: (0, 3)
(0, −3)
Foci: (4, 0)
(−4, 0)

3)



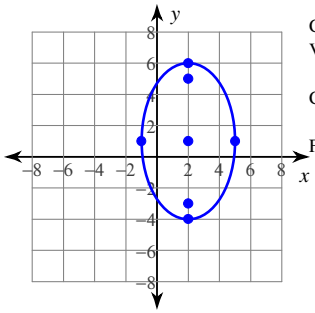
Center: (0, 0)
Vertices: (0, 2)
(0, −2)
Co-vertices: (1, 0)
(−1, 0)
Foci: $(0, \sqrt{3})$
$(0, -\sqrt{3})$

4)



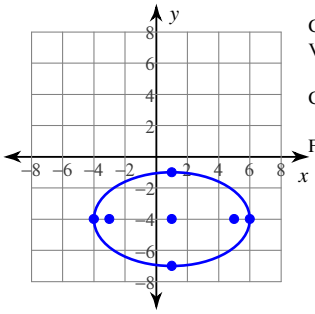
Center: (0, 0)
Vertices: (4, 0)
(−4, 0)
Co-vertices: (0, 3)
(0, −3)
Foci: $(\sqrt{7}, 0)$
$(-\sqrt{7}, 0)$

5)



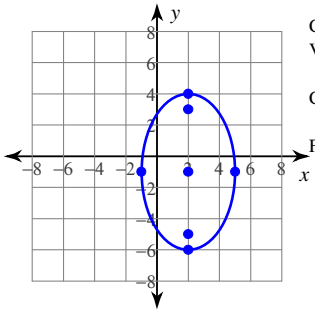
Center: (2, 1)
Vertices: (2, 6)
(2, −4)
Co-vertices: (5, 1)
(−1, 1)
Foci: (2, 5)
(2, −3)

6)



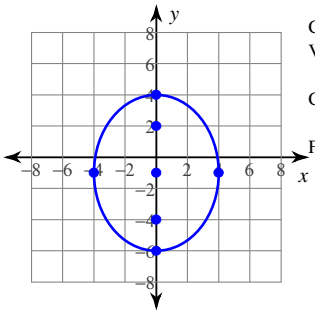
Center: (1, −4)
Vertices: (6, −4)
(−4, −4)
Co-vertices: (1, −1)
(1, −7)
Foci: (5, −4)
(−3, −4)

7)



Center: (2, −1)
Vertices: (2, 4)
(2, −6)
Co-vertices: (5, −1)
(−1, −1)
Foci: (2, 3)
(2, −5)

8)



Center: (0, −1)
Vertices: (0, 4)
(0, −6)
Co-vertices: (4, −1)
(−4, −1)
Foci: (0, 2)
(0, −4)

9) $\frac{(x+3)^2}{16} + \frac{(y-7)^2}{25} = 1$

10) $\frac{(x+6)^2}{16} + \frac{(y-7)^2}{25} = 1$

11) $\frac{(x+3)^2}{25} + \frac{(y+2)^2}{169} = 1$

12) $\frac{(x-1)^2}{144} + \frac{(y+1)^2}{169} = 1$

13) $\frac{(x+2)^2}{49} + \frac{(y+4)^2}{225} = 1$

14) $\frac{(x-7)^2}{25} + \frac{(y+1)^2}{49} = 1$

15) $\frac{(x+10)^2}{16} + \frac{(y-2)^2}{64} = 1$

16) $\frac{(x-3)^2}{25} + \frac{y^2}{144} = 1$

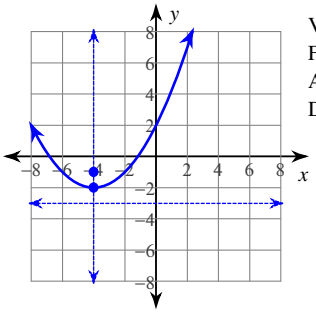
17) $\frac{(x-10)^2}{169} + \frac{(y+3)^2}{25} = 1$

18) $\frac{(x-6)^2}{25} + \frac{(y+3)^2}{169} = 1$

19) $\frac{(x-6)^2}{25} + \frac{(y+3)^2}{9} = 1$

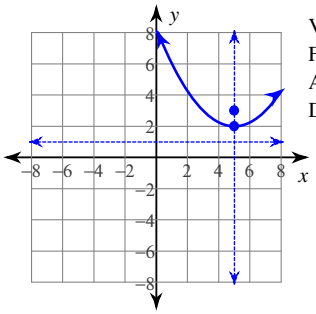
20) $\frac{(x-9)^2}{25} + \frac{(y-9)^2}{16} = 1$

21)



Vertex: $(-4, -2)$
Focus: $(-4, -1)$
Axis of Sym.: $x = -4$
Directrix: $y = -3$

22)



Vertex: $(5, 2)$
Focus: $(5, 3)$
Axis of Sym.: $x = 5$
Directrix: $y = 1$

23) $-4(x-5) = (y-5)^2$

24) $4(y+5) = (x+9)^2$

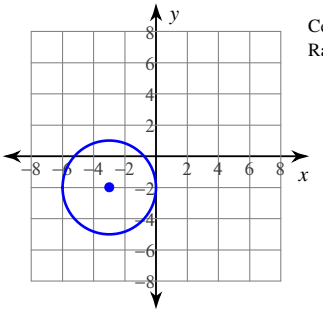
25) $-4(y+3) = (x-10)^2$

26) $-4(x+2) = (y-4)^2$

27) $-4(x+7) = (y-10)^2$

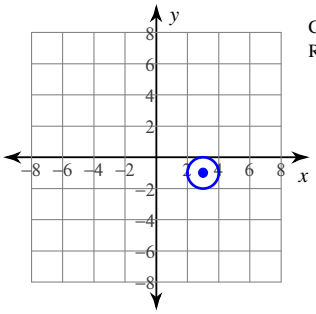
28) $-4(x-4) = (y-8)^2$

29)



Center: $(-3, -2)$
Radius: 3

30)



Center: $(3, -1)$
Radius: 1

31) $(x+3)^2 + (y+11)^2 = 25$

32) $(x-7)^2 + (y-11)^2 = 49$

33) $(x-15)^2 + (y+7)^2 = 16$

34) $(x-12)^2 + (y+2)^2 = 8$

35) y = 8x + 65

36) $y = \frac{1}{3}x + \frac{20}{3}$