Precalculus Name_____

Chapter 10 Retest Practice Packet

Classify each conic section

1) $9x^2 + 4y^2 + 54x - 63 = 0$

2) $16x^2 - y^2 - 64x + 48 = 0$

3) $-2y^2 + 7x - 20y - 92 = 0$

4) $x^2 + y^2 - 4x - 2y - 12 = 0$

5) $3x^2 - y^2 + 2y - 16 = 0$

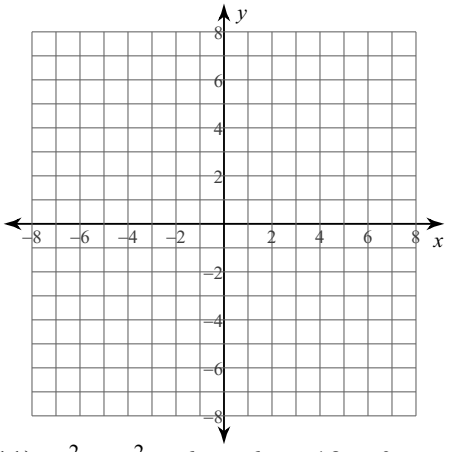
6) $x^2 + 2x + y + 4 = 0$

7) $4x^2 + 4y^2 - 4x + 3 = 0$

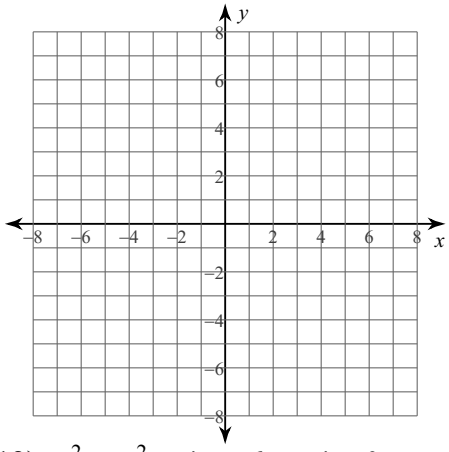
8) $9x^2 + y^2 - 4x + 8y + 7 = 0$

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

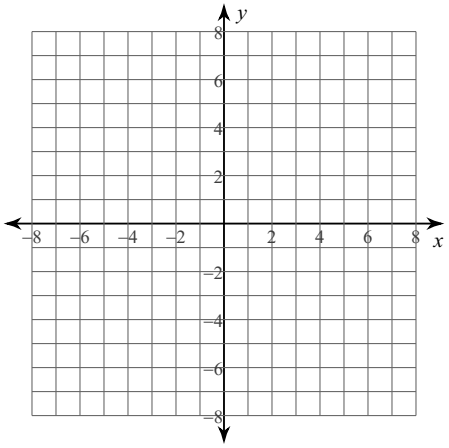
9) $(x + 3)^2 + (y + 1)^2 = 16$



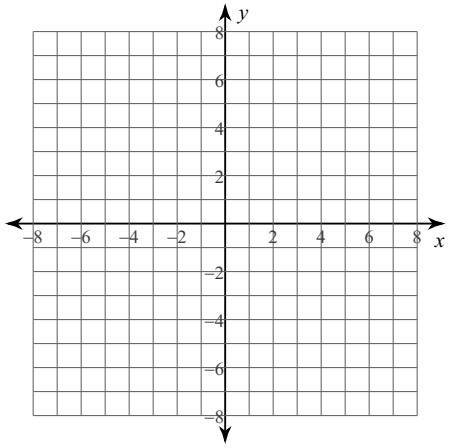
10) $(x + 4)^2 + (y - 1)^2 = 4$



11) $x^2 + y^2 + 6x + 6y + 12 = 0$



12) $x^2 + y^2 + 4x + 6y + 4 = 0$



Use the information provided to write the standard form equation of each circle. Use a seperate piece of graph paper if needed.

13) Center: $(10, -12)$
Radius: 3

14) Center: $(0, 9)$
Tangent to $y = 14$

15) Center: $(-2, 1)$
Tangent to $x = -11$

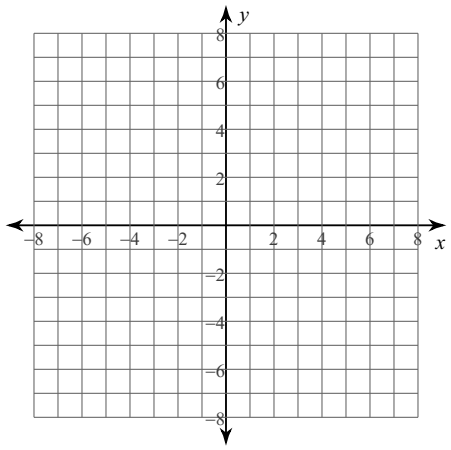
16) Center: $(11, 6)$
Point on Circle: $(10, 9)$

17) Center: $(-17, -9)$
Point on Circle: $(-17, -10)$

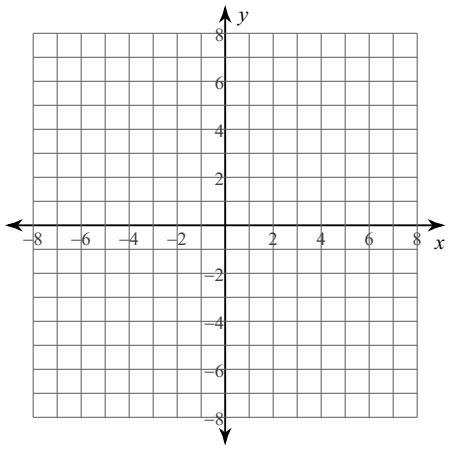
18) Ends of a diameter: $(4, 7)$ and $(6, 9)$

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

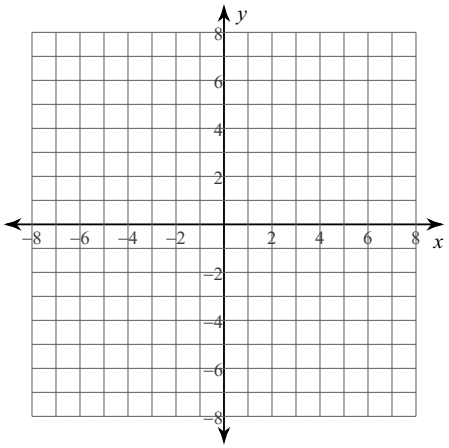
19) $\frac{(x+1)^2}{25} + \frac{(y+1)^2}{9} = 1$



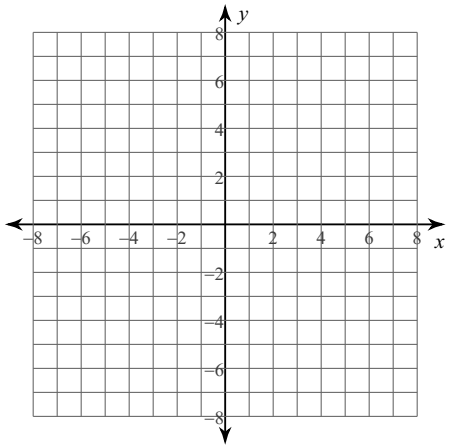
20) $\frac{(x+1)^2}{36} + \frac{(y+1)^2}{25} = 1$



21) $4x^2 + 25y^2 - 150y + 125 = 0$



22) $25x^2 + 36y^2 - 50x + 144y - 731 = 0$



Use the information provided to write the standard form equation of each ellipse. Use a seperate piece of graph paper if needed.

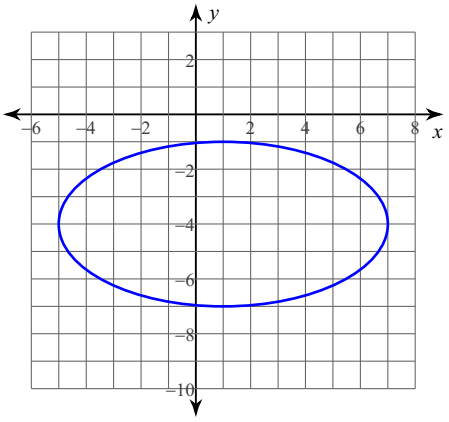
23) Vertices: $(6, 1), (-22, 1)$
Foci: $(-8 + 3\sqrt{19}, 1), (-8 - 3\sqrt{19}, 1)$

24) Vertices: $(13, 4), (-13, 4)$
Foci: $(2\sqrt{30}, 4), (-2\sqrt{30}, 4)$

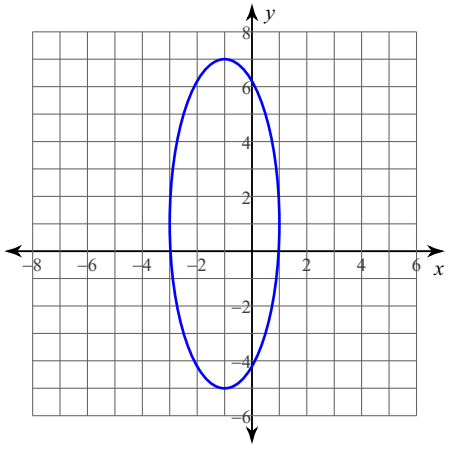
25) Foci: $(-9 + 2\sqrt{10}, -3), (-9 - 2\sqrt{10}, -3)$
Endpoints of major axis: $(2, -3), (-20, -3)$

26) Foci: $(4 + 3\sqrt{21}, -5), (4 - 3\sqrt{21}, -5)$
Endpoints of minor axis: $(4, 1), (4, -11)$

27)

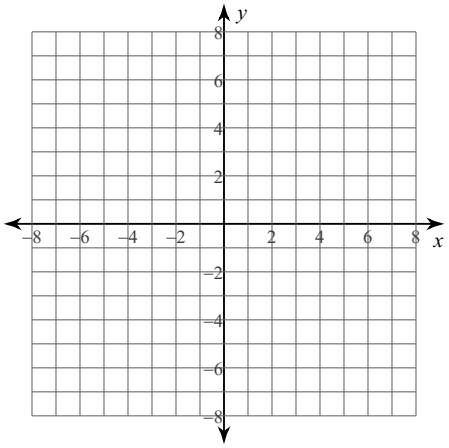


28)

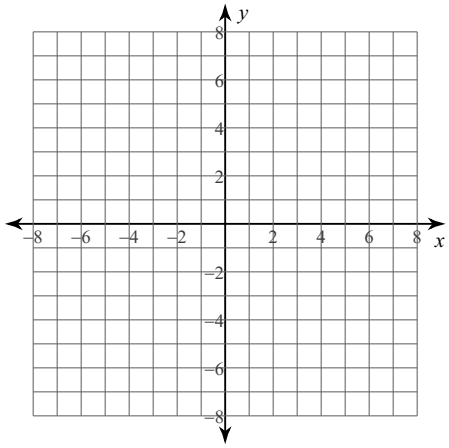


Identify the center, vertices, foci, and asymptotes of each. Then sketch the graph. Leave the equation of the asymptotes in the form y - k = +/-m(x - h).

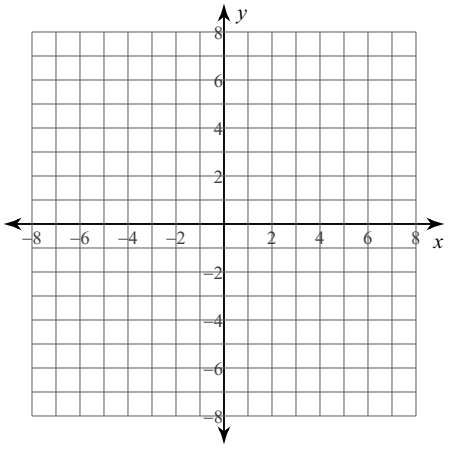
29) $\frac{(y-2)^2}{9} - \frac{x^2}{25} = 1$



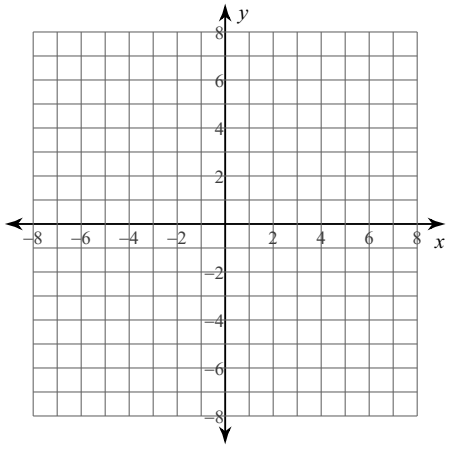
30) $\frac{y^2}{25} - (x-3)^2 = 1$



31) $x^2 - y^2 + 4x + 4y - 9 = 0$



32) $-9x^2 + 4y^2 - 36x - 8y - 68 = 0$



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

33) Vertices: $(-3, -4), (-3, -10)$
Conjugate Axis is 16 units long

34) Vertices: $(10, 9), (10, -11)$
Conjugate Axis is 14 units long

35) Foci: $(2, 5 + \sqrt{89}), (2, 5 - \sqrt{89})$
Conjugate Axis is 16 units long

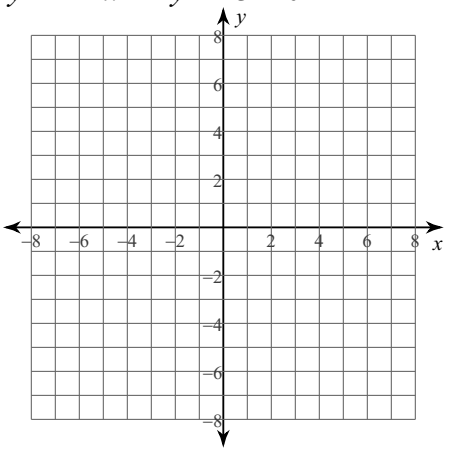
36) Foci: $(-8, 6 + \sqrt{37}), (-8, 6 - \sqrt{37})$
Conjugate Axis is 2 units long

37) Center at $(6, -1)$
Transverse axis is vertical and 12 units long
Congujate axis is 20 units long

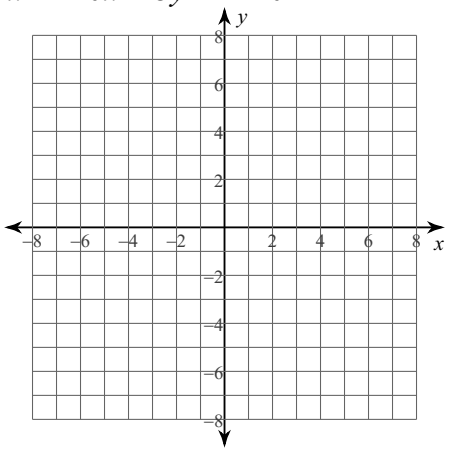
38) Vertices: $(5, 18), (5, -8)$
Foci: $(5, 5 + \sqrt{185}), (5, 5 - \sqrt{185})$

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

39) $y^2 + 12x - 2y + 13 = 0$



40) $x^2 + 10x + 8y + 1 = 0$



Use the information provided to write the transformational form equation of each parabola. Use a seperate piece of graph paper if needed.

41) Vertex: $(4, -8)$, Directrix: $x = 8$

42) Vertex: $(9, -4)$, Directrix: $y = 2$

43) Focus: $(4, -4)$, Directrix: $y = -10$

44) Focus: $(-1, 7)$, Directrix: $x = -5$

45) Vertex: $(10, -1)$, Focus: $(10, 0)$

46) Vertex: $(0, 6)$, Focus: $(1, 6)$

47) A semi elliptical arch is used to design a headboard for a bed frame. The headboard will have a height of 2 feet at the center and a width of 5 feet at the base. The craftsman will tie a 5 foot string to to tacks in order to sketch the outline of the headboard. Where should the craftsman place the tacks?

48) On August 17, 1999, an earthquake of magnitude 7.4 on the Richter scale rocked Western Turkey. Had a PADS been deployed 3 miles west and 4 miles north of Izmit, Turkey, it would have indicated that the epicenter was 11 miles away. Write an equation for the set of points representing all possible locations of the earthquake's epicenter. Assume that downtown Izmit, Turkey, is located at the origin.

49) Suppose the reciever in a parabolic dish antenna is 3 feet from the vertex and is located at the focus. Assume that the vertex is at the orgin and that the dish is pointed upward. Find an equation that models a cross section of the dish.

50) A dog is tethered to a post in the middle of a yard. The dog can reach out to a point that is 8 feet west and 15 feet south of the post. What is the equation of the circle that models the boundary of the farthest points the dog can reach in the yard?

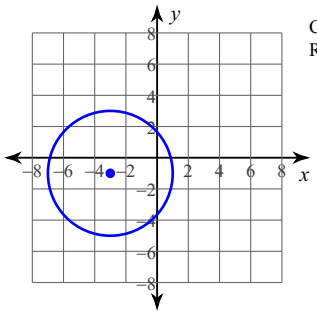
51) Write an equation of a hyperbola with vertices of (-5 , 1) and (5 , 1) and the conjugate axis is 8 units long.

52) Astronomers use special X-ray telescopes to observe the sources of celestial X rays. Some X-ray telescopes are fitted with a metal mirror in the shape of a hyperbola, which reflects the X rays to a focus. Suppose the asymptotes are at $y = \pm 2/5\ x$ and one focus is located at $(\sqrt{29}, 0)$. Write an equation that models the hyperbola formed by the mirror.

Answers to Chapter 10 Retest Practice Packet

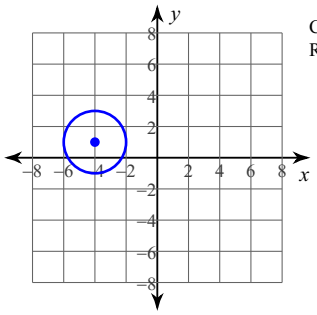
1) Ellipse
2) Hyperbola
3) Parabola
4) Circle
5) Hyperbola
6) Parabola
7) Circle
8) Ellipse

9)



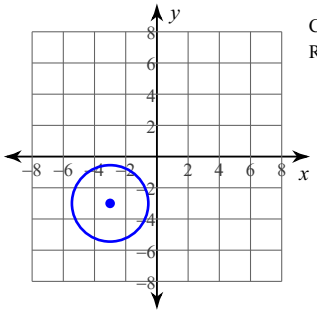
Center: $(-3, -1)$
Radius: 4

10)



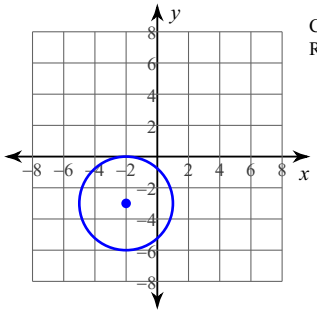
Center: $(-4, 1)$
Radius: 2

11)



Center: $(-3, -3)$
Radius: $\sqrt{6}$

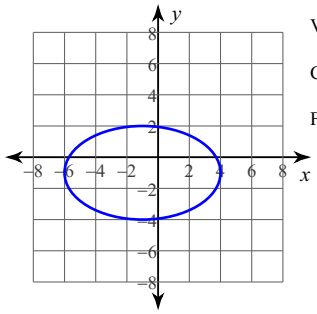
12)



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

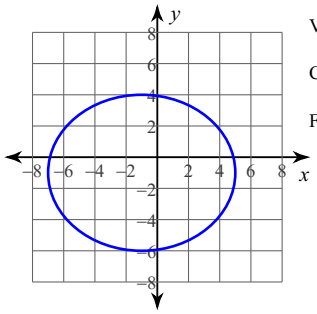
13) $(x-10)^2+(y+12)^2=9$
14) $x^2+(y-9)^2=25$
15) $(x+2)^2+(y-1)^2=81$
16) $(x-11)^2+(y-6)^2=10$
17) $(x+17)^2+(y+9)^2=1$
18) $(x-5)^2+(y-8)^2=2$

19)



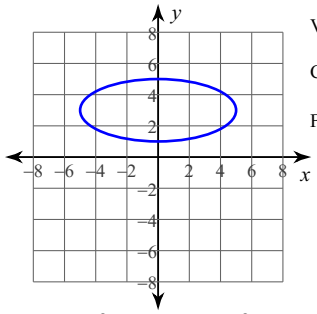
Vertices: $(4, -1)$, $(-6, -1)$
Co-vertices: $(-1, 2)$, $(-1, -4)$
Foci: $(3, -1)$, $(-5, -1)$

20)



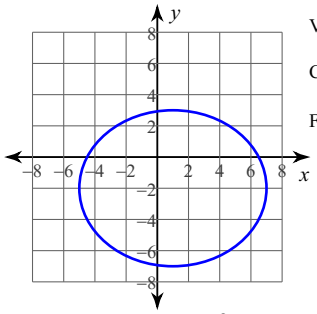
Vertices: $(5, -1)$, $(-7, -1)$
Co-vertices: $(-1, 4)$, $(-1, -6)$
Foci: $(-1+\sqrt{11}, -1)$, $(-1-\sqrt{11}, -1)$

21)



Vertices: $(5, 3)$, $(-5, 3)$
Co-vertices: $(0, 5)$, $(0, 1)$
Foci: $(\sqrt{21}, 3)$, $(-\sqrt{21}, 3)$

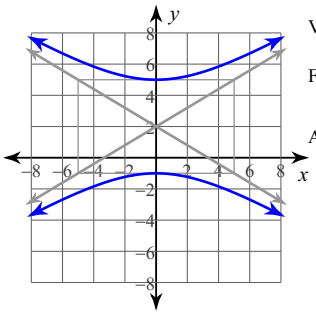
22)



Vertices: $(7, -2)$, $(-5, -2)$
Co-vertices: $(1, 3)$, $(1, -7)$
Foci: $(1+\sqrt{11}, -2)$, $(1-\sqrt{11}, -2)$

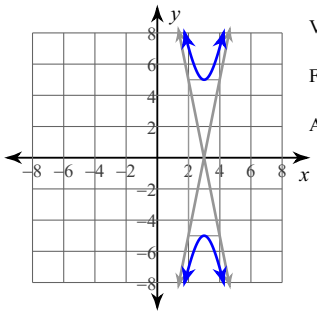
23) $\frac{(x+8)^2}{196}+\frac{(y-1)^2}{25}=1$
24) $\frac{x^2}{169}+\frac{(y-4)^2}{49}=1$
25) $\frac{(x+9)^2}{121}+\frac{(y+3)^2}{81}=1$
26) $\frac{(x-4)^2}{225}+\frac{(y+5)^2}{36}=1$
27) $\frac{(x-1)^2}{36}+\frac{(y+4)^2}{9}=1$
28) $\frac{(x+1)^2}{4}+\frac{(y-1)^2}{36}=1$

29)



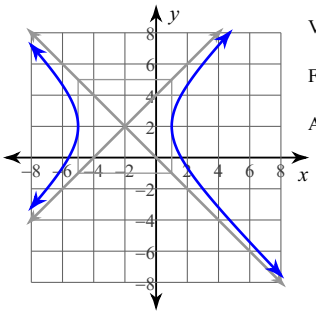
Vertices: $(0, 5)$ $(0, -1)$
Foci: $(0, 2 + \sqrt{34})$ $(0, 2 - \sqrt{34})$
Asym.: $y = \frac{3}{5}x + 2$ $y = -\frac{3}{5}x + 2$

30)



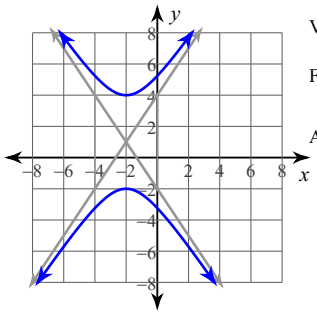
Vertices: $(3, 5)$ $(3, -5)$
Foci: $(3, \sqrt{26})$ $(3, -\sqrt{26})$
Asym.: $y = 5x - 15$ $y = -5x + 15$

31)



Vertices: $(1, 2)$ $(-5, 2)$
Foci: $(-2 + 3\sqrt{2}, 2)$ $(-2 - 3\sqrt{2}, 2)$
Asym.: $y = x + 4$ $y = -x$

32)



Vertices: $(-2, 4)$ $(-2, -2)$
Foci: $(-2, 1 + \sqrt{13})$ $(-2, 1 - \sqrt{13})$
Asym.: $y = \frac{3}{2}x + 4$ $y = -\frac{3}{2}x - 2$

33) $\frac{(y+7)^2}{9} - \frac{(x+3)^2}{64} = 1$

34) $\frac{(y+1)^2}{100} - \frac{(x-10)^2}{49} = 1$

35) $\frac{(y-5)^2}{25} - \frac{(x-2)^2}{64} = 1$

36) $\frac{(y-6)^2}{36} - (x+8)^2 = 1$

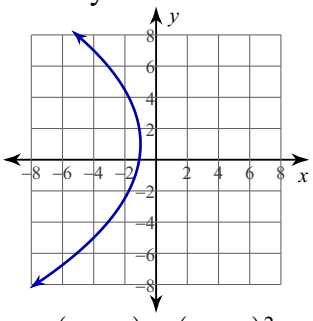
37) $\frac{(y+1)^2}{36} - \frac{(x-6)^2}{100} = 1$

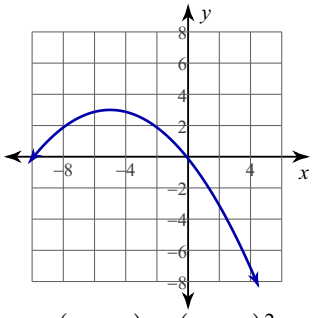
38) $\frac{(y-5)^2}{169} - \frac{(x-5)^2}{16} = 1$

39) vertex: (-1,1)
focus:(-4,1)
directrix: x = 2
a.o.s.: y = 1

40) vertex: (-5,3)
focus:(-5,1)
directrix: y = 5
a.o.s.: x=-5

41) $-16(x-4) = (y+8)^2$





42) $-24(y+4) = (x-9)^2$

43) $-12(y+6) = (x-4)^2$

44) $8(y-7) = (x+3)^2$

45) $4(y+1) = (x-10)^2$

46) $4x = (y-6)^2$

47) 1.5 feet to the left and right of the center

48) $(x+3)^2 + (y-4)^2 = 121$

49) $(x+0)^2 = 12(y+0)$ or $x^2 = 12y$

50) $(x+8)^2 + (y+15)^2 = 289$

51) $\frac{x^2}{25} - \frac{y^2}{16} = 1$

52) $\frac{(x+0)^2}{25} - \frac{(y+0)^2}{4} = 1$ or $\frac{x^2}{25} - \frac{y^2}{4} = 1$

