

# Conics Test REVIEW

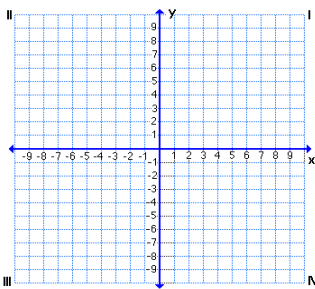
Pre-Calculus

Name: \_\_\_\_\_

Hour: \_\_\_\_\_

Find the center and the exact radius of the **circle**. Then graph the circle.

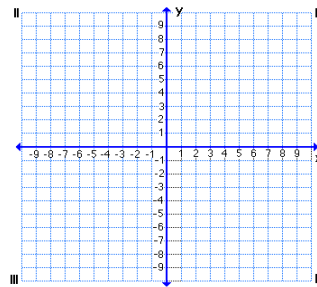
1.  $(x - 5)^2 + (y + 3)^2 = 9$



Center: \_\_\_\_\_

Radius: \_\_\_\_\_

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



Center: \_\_\_\_\_

Radius: \_\_\_\_\_

Find the equation of the **circle** in standard form that satisfies the given conditions.

3. The circle has center  $(0, 0)$  and passes through  $(-3, 4)$ .

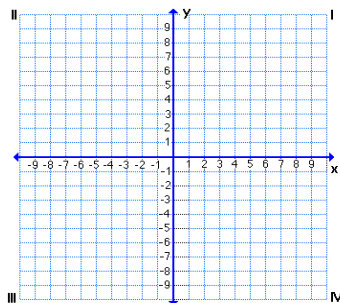
4. The circle has center  $(-4, -3)$  and passes through  $(-1, -1)$ .

5. The endpoints of the diameter of the circle are  $(2, 6)$  and  $(-8, 4)$ .

6. The circle has center  $(4, -3)$  and is tangent to the x-axis.

Graph the **ellipse** and identify the center, vertices, and foci.

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

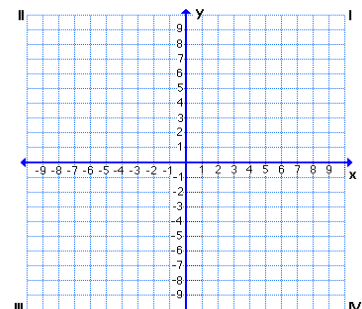


Center: \_\_\_\_\_

Vert: \_\_\_\_\_

Foci: \_\_\_\_\_

8.  $4x^2 + 9y^2 = 36$

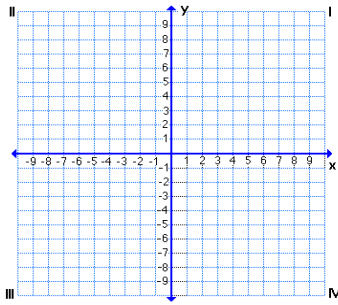


Center: \_\_\_\_\_

Vert: \_\_\_\_\_

Foci: \_\_\_\_\_

9.  $x^2 + 4y^2 = 36$

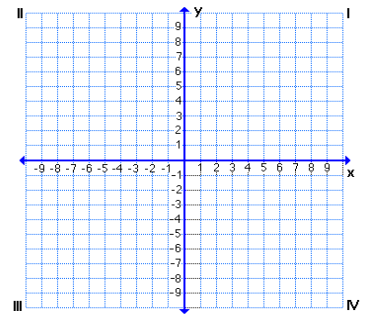


Center: \_\_\_\_\_

Vert: \_\_\_\_\_

Foci: \_\_\_\_\_

10.  $(x + 1)^2 + \frac{(y-3)^2}{4} = 1$

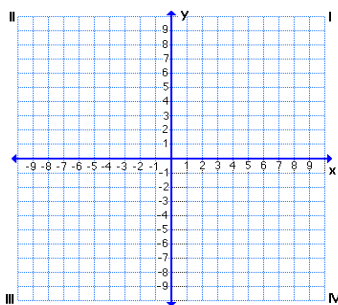


Center: \_\_\_\_\_

Vert: \_\_\_\_\_

Foci: \_\_\_\_\_

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

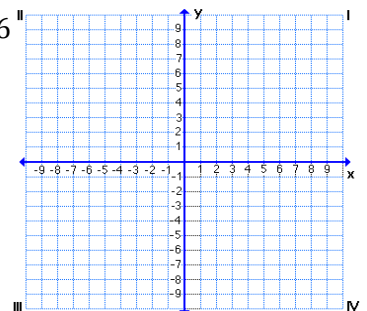


Center: \_\_\_\_\_

Vert: \_\_\_\_\_

Foci: \_\_\_\_\_

12.  $36(x + 4)^2 + (y + 3)^2 = 36$



Center: \_\_\_\_\_

Vert: \_\_\_\_\_

Foci: \_\_\_\_\_

**Find the standard form of the equation of each ellipse.**

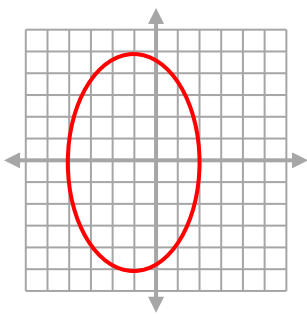
13. Foci  $(0, \pm 3)$ , vertices  $(0, \pm 5)$

14. Major axis horizontal with length 12; length of minor axis 4; center:  $(-1, 3)$

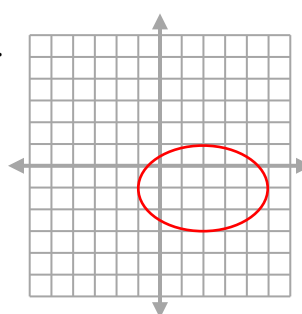
15. Foci  $(\pm 5, 0)$ , length of major axis 12

16. Endpoints of major axis:  $(2, 2)$  &  $(8, 2)$   
Endpoints of minor axis:  $(5, 3)$  &  $(5, 1)$

17.

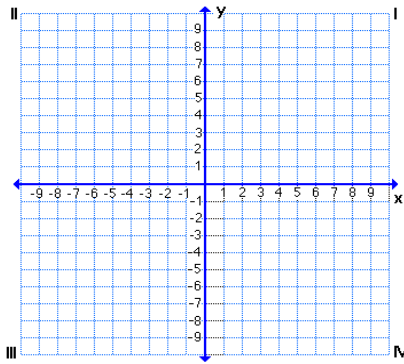


18.



Graph the **hyperbola** and identify the center, vertices, slopes of asymptotes, and foci.

19.  $\frac{y^2}{9} - \frac{x^2}{16} = 1$



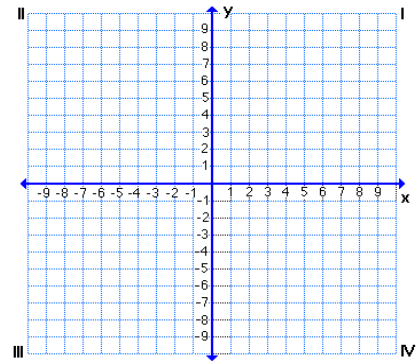
Center: \_\_\_\_\_

Vertices: \_\_\_\_\_

Foci: \_\_\_\_\_

Asymptotes: \_\_\_\_\_

20.  $4x^2 - y^2 = 16$



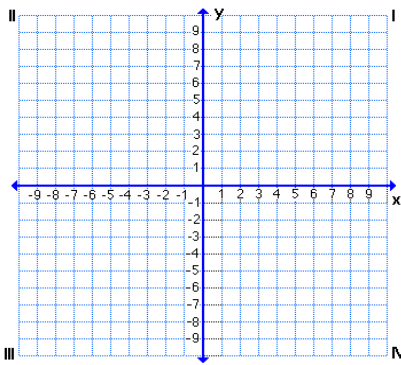
Center: \_\_\_\_\_

Vertices: \_\_\_\_\_

Foci: \_\_\_\_\_

Asymptotes: \_\_\_\_\_

21.  $4(x - 1)^2 - 9(y + 2)^2 = 36$



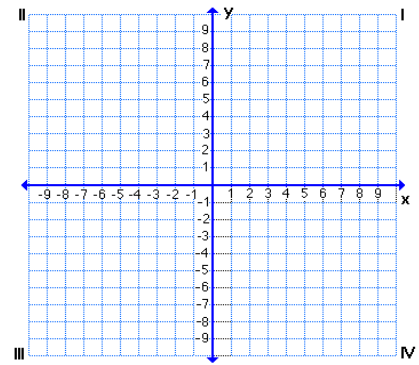
Center: \_\_\_\_\_

Vertices: \_\_\_\_\_

Foci: \_\_\_\_\_

Asymptotes: \_\_\_\_\_

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



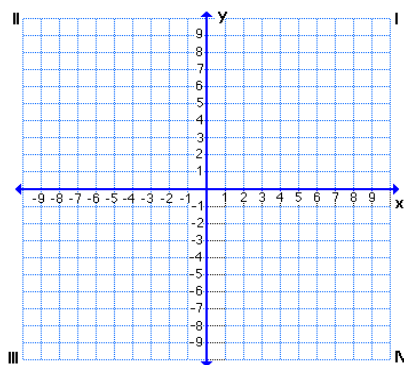
Center: \_\_\_\_\_

Vertices: \_\_\_\_\_

Foci: \_\_\_\_\_

Asymptotes: \_\_\_\_\_

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



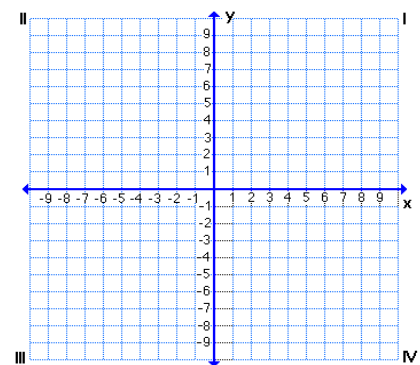
Center: \_\_\_\_\_

Vertices: \_\_\_\_\_

Foci: \_\_\_\_\_

Asymptotes: \_\_\_\_\_

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



Center: \_\_\_\_\_

Vertices: \_\_\_\_\_

Foci: \_\_\_\_\_

Asymptotes: \_\_\_\_\_

Find the standard form of the equation of each **hyperbola**.

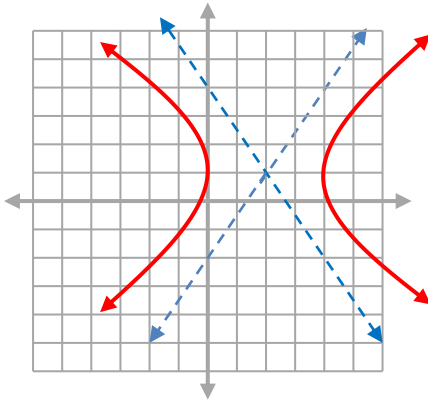
25. Foci  $(0, \pm 4)$ , vertices  $(0, \pm 2)$

26. Vertices  $(\pm 4, 0)$ , Asymptotes:  $y = \pm 3x$

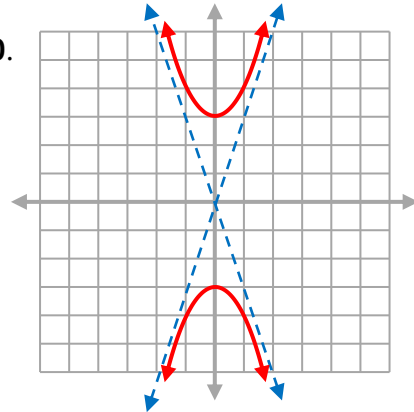
27. Endpoints of transverse axis:  $(\pm 6, 0)$   
Asymptotes:  $y = \pm 2x$

28. Foci  $(0, \pm 3)$ , length of transverse axis 2

29.

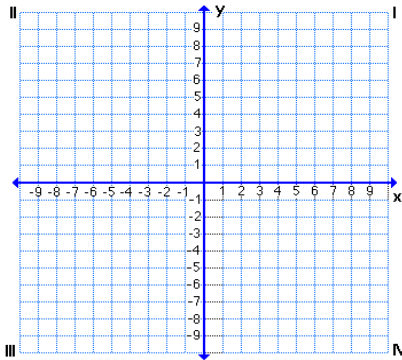


30.



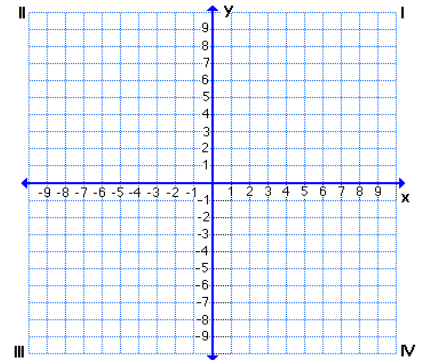
Graph the **parabola** and identify the vertex, directrix, and focus.

31.  $y^2 = -12x$



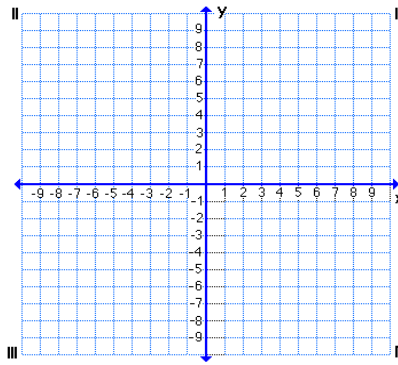
Vertex: \_\_\_\_\_  
Dir: \_\_\_\_\_  
Focus: \_\_\_\_\_

32.  $x^2 = 8y$



Vertex: \_\_\_\_\_  
Dir: \_\_\_\_\_  
Focus: \_\_\_\_\_

33.  $6(x + 1)^2 + 12(y - 3) = 0$

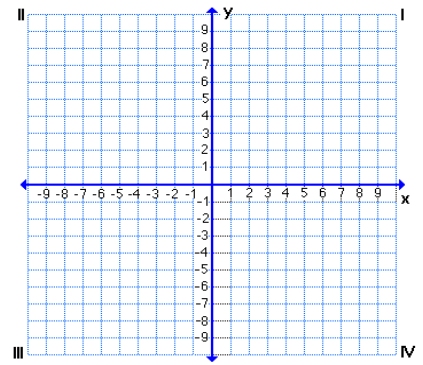


Vertex: \_\_\_\_\_

Dir: \_\_\_\_\_

Focus: \_\_\_\_\_

34.  $y^2 - 12(x + 2) = 0$

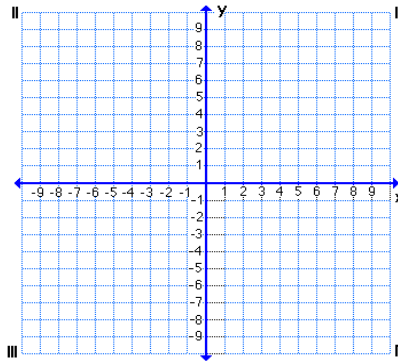


Vertex: \_\_\_\_\_

Dir: \_\_\_\_\_

Focus: \_\_\_\_\_

35.  $(x + 2)^2 = -8(y + 2)$

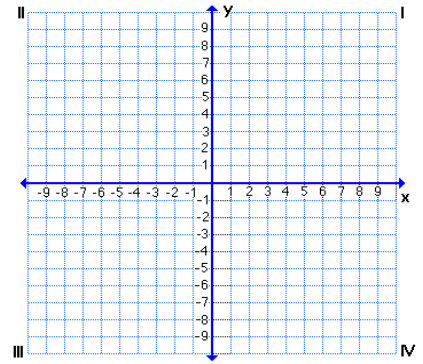


Vertex: \_\_\_\_\_

Dir: \_\_\_\_\_

Focus: \_\_\_\_\_

36.  $(y - 1)^2 = -8x$



Vertex: \_\_\_\_\_

Dir: \_\_\_\_\_

Focus: \_\_\_\_\_

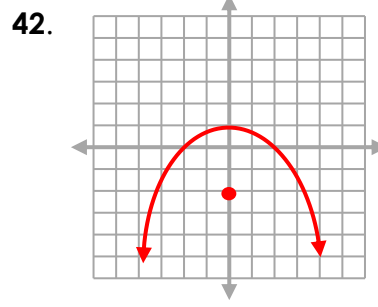
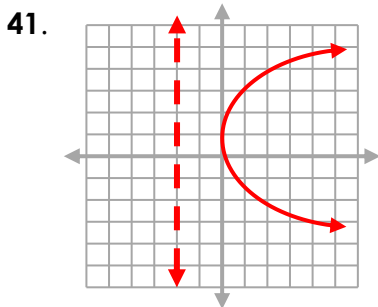
Write an equation in standard form for the **parabola** satisfying the given conditions.

37. Focus:  $(9, 0)$ ; Directrix:  $x = -9$

38. Focus:  $(-10, 0)$ ; Directrix:  $x = 10$

39. Vertex:  $(5, -2)$ ; Focus  $(7, -2)$

40. Focus:  $(2, 4)$ ; Directrix:  $x = -4$



**Convert the equation to standard form by completing the square. Then identify what type of conic section the equation represents. If it is a circle, ellipse, or hyperbola, then name its center. If it is a parabola, then name its vertex.**

**43.**  $x^2 + 6x + 8y + 1 = 0$

**44.**  $9y^2 - 4x^2 - 18y + 24x - 63 = 0$

**45.**  $4x^2 + 36y - 32x + 9y^2 + 64 = 0$

**46.**  $9x^2 + 16y^2 - 18x + 64y - 71 = 0$

**47.**  $4x^2 - y^2 + 32x + 6y + 39 = 0$

**48.**  $x^2 + y^2 - 6x + 8y = 1$

**49.**  $4x^2 + 4y^2 - 24x + 32y - 4 = 0$

**50.**  $y^2 + 8y - 4x + 8 = 0$

**Answers to Conics Test Review**

Pre-Calculus

Name: \_\_\_\_\_

Hour: \_\_\_\_\_

1. Center:  $(5, -3)$ ; Radius: 3      2. Center:  $(-3, 0)$ ; Radius:  $\frac{5}{3}$       3.  $x^2 + y^2 = 25$
4.  $(x + 4)^2 + (y + 3)^2 = 13$       5.  $(x + 3)^2 + (y - 5)^2 = 26$       6.  $(x - 4)^2 + (y + 3)^2 = 9$
7. C:  $(0, 0)$ ; V:  $(0, \pm 5)$ ; F:  $(0, \pm 4)$       8. C:  $(0, 0)$ ; V:  $(\pm 3, 0)$ ; F:  $(\pm\sqrt{5}, 0)$       9. C:  $(0, 0)$ ; V:  $(\pm 6, 0)$ ; F:  $(\pm 3\sqrt{3}, 0)$
10. C:  $(-1, 3)$ ; V:  $(-1, 5), (-1, 1)$ ; F:  $(-1, 3 \pm \sqrt{3})$       11. C:  $(1, -2)$ ; V:  $(1, 1), (1, -5)$ ; F:  $(1, -2 \pm \sqrt{5})$
12. C:  $(-4, -3)$ ; V:  $(-4, 3), (-4, -9)$ ; F:  $(-4, -3 \pm \sqrt{35})$       13.  $\frac{x^2}{16} + \frac{y^2}{25} = 1$       14.  $\frac{(x+1)^2}{36} + \frac{(y-3)^2}{4} = 1$
15.  $\frac{x^2}{36} + \frac{y^2}{11} = 1$       16.  $\frac{(x-5)^2}{9} + \frac{(y-2)^2}{1} = 1$       17.  $\frac{(x+1)^2}{9} + \frac{y^2}{25} = 1$       18.  $\frac{(x-2)^2}{9} + \frac{(y+1)^2}{4} = 1$
19. C:  $(0, 0)$ ; V:  $(0, \pm 3)$ ; F:  $(0, \pm 5)$ ; A:  $\pm \frac{3}{4}$       20. C:  $(0, 0)$ ; V:  $(\pm 2, 0)$ ; F:  $(\pm 2\sqrt{5}, 0)$ ; A:  $\pm \frac{4}{2}$
21. C:  $(1, -2)$ ; V:  $(-2, -2), (4, -2)$ ; F:  $(1 \pm \sqrt{13}, -2)$ ; A:  $\pm \frac{2}{3}$
22. C:  $(2, -1)$ ; V:  $(2, 4), (2, -6)$ ; F:  $(2, -1 \pm \sqrt{34})$ ; A:  $\pm \frac{5}{3}$
23. C:  $(3, -2)$ ; V:  $(3, 3), (3, -7)$ ; F:  $(3, -2 \pm \sqrt{41})$ ; A:  $\pm \frac{5}{4}$
24. C:  $(2, -3)$ ; V:  $(-3, -3), (7, -3)$ ; F:  $(2 \pm \sqrt{41}, -3)$ ; A:  $\pm \frac{4}{5}$       25.  $\frac{y^2}{4} - \frac{x^2}{12} = 1$       26.  $\frac{x^2}{16} - \frac{y^2}{144} = 1$
27.  $\frac{x^2}{36} - \frac{y^2}{144} = 1$       28.  $\frac{y^2}{1} - \frac{x^2}{8} = 1$       29.  $\frac{(x-2)^2}{4} - \frac{(y-1)^2}{9} = 1$       30.  $\frac{y^2}{9} - \frac{x^2}{1} = 1$
31. V:  $(0, 0)$ ; D:  $x = 3$ ; F:  $(-3, 0)$       32. V:  $(0, 0)$ ; D:  $y = -2$ ; F:  $(0, 2)$       33. V:  $(-1, 3)$ ; D:  $y = 3.5$ ; F:  $(-1, 2.5)$
34. V:  $(-2, 0)$ ; D:  $x = -5$ ; F:  $(1, 0)$       35. V:  $(-2, -2)$ ; D:  $y = 0$ ; F:  $(-2, -4)$       36. V:  $(0, 1)$ ; D:  $x = 2$ ; F:  $(-2, 1)$
37.  $y^2 = 36x$       38.  $y^2 = -40x$       39.  $(y + 2)^2 = 8(x - 5)$       40.  $(y - 4)^2 = 12(x - 2)$
41.  $(y - 1)^2 = 8x$       42.  $x^2 = -12(y - 1)$       43.  $(x + 3)^2 = -8(y - 1)$ ; Parabola; V:  $(-3, 1)$
44.  $\frac{(y-1)^2}{4} - \frac{(x-3)^2}{9} = 1$ ; Hyperbola; C:  $(3, 1)$       45.  $\frac{(x-4)^2}{9} + \frac{(y+2)^2}{4} = 1$ ; Ellipse; C:  $(4, -2)$
46.  $\frac{(x-1)^2}{16} + \frac{(y+2)^2}{9} = 1$ ; Ellipse; C:  $(1, -2)$       47.  $\frac{(x+4)^2}{4} - \frac{(y-3)^2}{16} = 1$ ; Hyperbola; C:  $(-4, 3)$
48.  $(x - 3)^2 + (y + 4)^2 = 26$ ; Circle; C:  $(3, -4)$       49.  $(x - 3)^2 + (y + 4)^2 = 26$ ; Circle; C:  $(3, -4)$
50.  $(y + 4)^2 = 4(x + 2)$ ; Parabola; V:  $(-2, -4)$