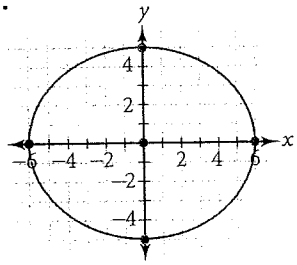
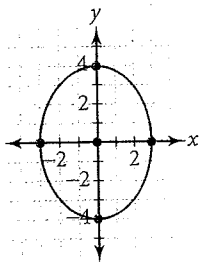
Write the standard equation for each ellipse.

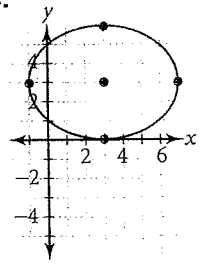
21.



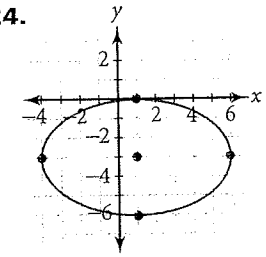
22.



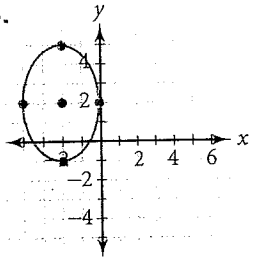
23.



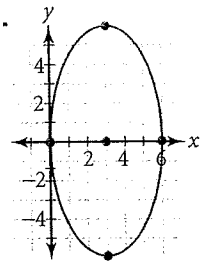
24.



25.



26.



Sketch the graph of each ellipse. Label the center, foci, vertices, and co-vertices.

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

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

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

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

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

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

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

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

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

36. $16(x+1)^2+9(y-1)^2=144$

37. $9(x-1)^2+25(y+2)^2=225$

38. $4x^2+25y^2=100$

39. $25x^2+9y^2=225$

Write the standard equation for the ellipse with the given characteristics.

40. foci: (5, 0), (−5, 0)
vertices: (9, 0), (−9, 0)

41. foci: (0, 4), (0, −4)
vertices: (0, 8), (0, −8)

42. foci: (7, 0), (−7, 0)
co-vertices: (0, 3), (0, −3)

43. foci: (0, 3), (0, −3)
co-vertices: (1, 0), (−1, 0)

44. co-vertices: (0, 2), (0, −2)
vertices: (3, 0), (−3, 0)

45. vertices: (5, 0), (−5, 0)
co-vertices: (0, 4), (0, −4)

State whether each equation represents a parabola, a circle, or an ellipse.

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

47. $\frac{y}{4}=\frac{(x+2)^2}{2}$

48. $\frac{(x-1)^2}{12}=6-\frac{(y+5)^2}{9}$

49. $\frac{(y+4)^2}{6}=8-\frac{(x-1)^2}{4}$

Write the standard equation for each ellipse.

50. $x^2+4y^2+6x-8y=3$

51. $16x^2+4y^2+32x-8y=44$

52. $x^2+16y^2-64y=0$

53. $25x^2+y^2-50x=0$

54. $4x^2+9y^2-16x+18y=11$

55. $25x^2+9y^2+100x+18y=116$

56. $9x^2+16y^2-36x-64y-44=0$

57. $36x^2+25y^2-72x+100y=764$