

**Guided Practice**

For each equation, find the coordinates of the center, foci, and vertices. Then graph the equation. 5-10. See margin. For graphs, see Teacher's A

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

7.  $\frac{(x+2)^2}{81} + \frac{y^2}{49} = 1$

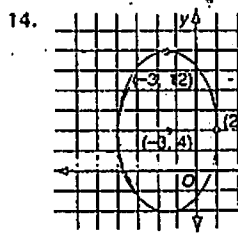
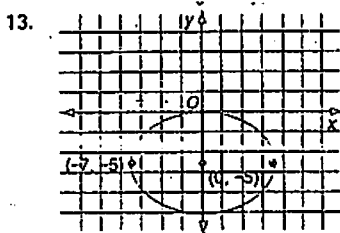
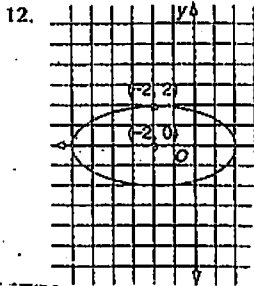
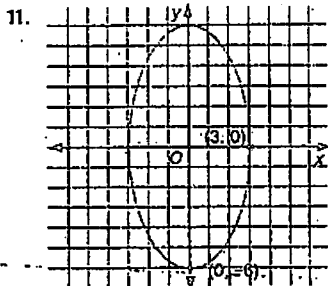
9.  $\frac{x^2}{16} + \frac{(y+9)^2}{64} = 1$

6.  $\frac{(x-4)^2}{16} + \frac{(y+6)^2}{9} = 1$

8.  $\frac{(x-6)^2}{100} + \frac{(y-7)^2}{121} = 1$

10.  $\frac{(x+10)^2}{225} + \frac{(y-9)^2}{64} = 1$

Write the standard equation of each ellipse.



**EXERCISES 15-22** See margin. For graphs, see Teacher's Answer Key.

**Practice** For each equation, find the coordinates of the center, foci, and vertices. Then graph the equation.



15.  $\frac{(x-3)^2}{25} + \frac{(y-4)^2}{16} = 1$

17.  $4x^2 + 9y^2 = 36$

16.  $\frac{(x+2)^2}{4} + \frac{(y-7)^2}{25} = 1$

18.  $9x^2 + 4y^2 - 18x = 1$

19.  $4y^2 - 8y + 9x^2 - 54x + 49 = 0$

20.  $x^2 - 2x + y^2 - 2y - 6 = 0$

21.  $9y^2 + 108y + 4x^2 - 56x = -484$

22.  $18x^2 + 12y^2 - 144x - 48y = -120$

Write the equation of the ellipse that meets each set of conditions.

23. The center is the origin,  $a = 8$ ,  $b = 6$ , and the major axis is parallel to  $y$ -axis.

24. The center is at  $(-3, -1)$ , the length of the horizontal semi-major axis is 7 units, and the length of semi-minor axis is 5 units.

State whether the graph of each equation is a circle, parabola, or ellipse. Justify your answer. 29-34.

29.  $x^2 + 3y^2 + 2x - 5y = 129$

30.  $x^2 + y + 4x - 2 = 0$

31.  $2x^2 - 5x + y - 19 = 0$

32.  $y^2 + 2y = x - x^2 + 12$

33.  $5x^2 - 2x + 2y^2 - 9y = 22$

34.  $12x^2 + 24x + 12y^2 + 72y = 124$