In Exercises 27–32 find and then compare lengths of segments.

B **27.** Show that the triangle with vertices $A(-3, 4)$, $M(3, 1)$, and $Y(0, -2)$ is isosceles.

28. Quadrilateral $TAUL$ has vertices $T(4, 6)$, $A(6, -4)$, $U(-4, -2)$, and $L(-2, 4)$. Show that the diagonals are congruent.

29. Triangles JAN and RFK have vertices $J(-2, -2)$, $A(4, -2)$, $N(2, 2)$, $R(8, 1)$, $F(8, 4)$, and $K(6, 3)$. Show that $\triangle JAN$ is similar to $\triangle RFK$.

30. The vertices of $\triangle KAT$ and $\triangle IES$ are $K(3, -1)$, $A(2, 6)$, $T(5, 1)$, $I(-4, 1)$, $E(-3, -6)$, and $S(-6, -1)$. What word best describes the relationship between $\triangle KAT$ and $\triangle IES$?

31. Find the area of the rectangle with vertices $B(8, 0)$, $T(2, -9)$, $R(-1, -7)$, and $C(5, 2)$.

32. Show that the triangle with vertices $D(0, 0)$, $E(3, 1)$, and $F(-2, 6)$ is a right triangle, then find the area of the triangle.

33. There are twelve points, each with integer coordinates, that are 10 units from the origin. List the points. (*Hint*: Recall the 6, 8, 10 right triangle.)

34. **a.** List twelve points, each with integer coordinates, that are 5 units from $(-8, 1)$.

b. Find an equation of the circle containing these points.

In Exercises 35–38 find an equation of the circle described and sketch the graph.

35. The circle has center (0, 6) and passes through point (6, 14).

36. The circle has center $(-2, -4)$ and passes through point (3, 8).

37. The circle has diameter $\overline{RS}$ where R is $(-3, 2)$ and S is (3, 2).

38. The circle has center (p, q) and is tangent to the x-axis.

39. **a.** Find the radii of the circles

$$x^2 + y^2 = 25 \text{ and } (x - 9)^2 + (y - 12)^2 = 100.$$

b. Find the distance between the centers of the circles.

c. Explain why the circles must be externally tangent.

d. Sketch the graphs of the circles.

40. **a.** Find the radii of the circles

$$x^2 + y^2 = 2 \text{ and } (x - 3)^2 + (y - 3)^2 = 32.$$

b. Find the distance between the centers of the circles.

c. Explain why the circles must be internally tangent.

d. Sketch the graphs of the circles.

41. Discover and prove something about the quadrilateral with vertices $R(-1, -6)$, $A(1, -3)$, $Y(11, 1)$, and $J(9, -2)$.

42. Discover and prove two things about the triangle with vertices $K(-3, 4)$, $M(3, 1)$, and $J(-6, -2)$.

C **43.** It is known that $\triangle GHM$ is isosceles. G is point $(-2, -3)$, H is point $(-2, 7)$, and the x-coordinate of M is 4. Find all five possible values for the y-coordinate of M.