

GEOMETRY A *median* of a triangle is a line segment joining a vertex and the midpoint of the opposite side. The ordered pairs represent vertices of a triangle. Write an equation of the line containing the median that joins the first vertex to the side opposite it.

38. (8, 4), (0, 0), (10, 0) 39. (3, 10), (4, 2), (10, 8) 40. (2, 6), (3, 1), (7, 5)

FINDING A COORDINATE Use the given distance d between the two points to find the value of x or y .

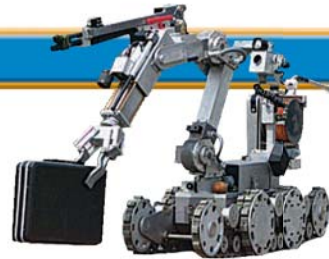
41. (0, 3), (x, 5); $d = 2\sqrt{10}$ 42. (-3, -1), (2, y); $d = \sqrt{41}$

43. (x, 7), (-4, 1); $d = 6\sqrt{2}$ 44. (1, y), (8, 13); $d = \sqrt{74}$

45. **REASONING** Let (x, y) be any point on the line $y = 2x$. Write and simplify an equation that gives the distance d between (x, y) and $(2, 3)$ as a function of x alone. Then find the coordinates of two points on the line $y = 2x$ that are each $\sqrt{10}$ units from $(2, 3)$.

46. **CHALLENGE** Show that $M\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$ is the midpoint of the line segment with endpoints (x_1, y_1) and (x_2, y_2) . To do this, show that M is equidistant from each endpoint and that M lies on the line containing (x_1, y_1) and (x_2, y_2) .

PROBLEM SOLVING



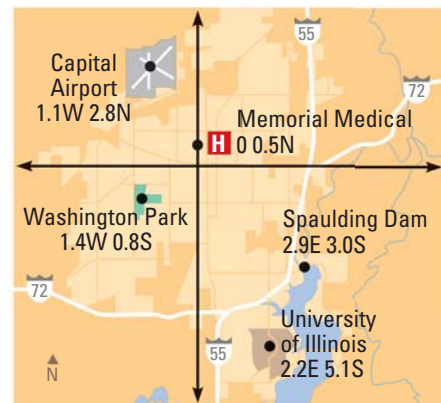
EXAMPLE 1
on p. 614
for Exs. 47–52

47. **ROBOTS** A remote-controlled robot can be instructed to move by entering coordinates on a control panel. If the robot is instructed to move from $(6, 11)$ straight to $(-2, 26)$, how far does the robot move? Assume the coordinates are in meters.

TEXAS @HomeTutor for problem solving help at classzone.com

HELICOPTER RESCUE In Exercises 48–51, use the information given to find the distance a medical evacuation (“medevac”) helicopter would have to fly to Memorial Medical Center from each location.

The Highway Department in Sangamon County, Illinois, uses a map that has its origin in central Springfield. Each unit on the map represents 1 mile, and the letters N, S, E, and W indicate direction. For example, 4W 5.6N is 4 miles west and 5.6 miles north of the origin. On a coordinate plane, 4W 5.6N corresponds to the point $(-4, 5.6)$. Memorial Medical is at 0 0.5N, or $(0, 0.5)$.



48. Capital Airport 49. University of Illinois
50. Washington Park 51. Spaulding Dam

TEXAS @HomeTutor for problem solving help at classzone.com

52. **COMMUTING** To get from her home to her office, Li must drive around a lake. If she drives 2 miles north, then 5 miles east, and then 4 miles south, what is the straight-line distance between Li’s home and her office?