

7.6 Practice

Midpoint and Distance in the Coordinate Plane

Find the coordinate of the midpoint of the segment with the given endpoints.

1. 3 and 5 **4** 2. -7 and 4 **$-\frac{3}{2}$** 3. 5 and -9 **-2** 4. -6 and -10 **-8**

Find the coordinates of the midpoint of \overline{AB} .

5. $A(6, 7), B(4, 3)$ **$(5, 5)$** 6. $A(-1, 5), B(2, -3)$ **$(\frac{1}{2}, 1)$**
 7. $A(14, -2), B(7, -8)$ **$(10\frac{1}{2}, -5)$** 8. $A(0, 0), B(-5, 12)$ **$(-2\frac{1}{2}, 6)$**
 9. $A(2.8, 1.1), B(-3.4, 5.7)$ **$(-0.3, 3.4)$** 10. $A(2\frac{1}{2}, -\frac{1}{4}), B(3\frac{1}{4}, -1)$ **$(2\frac{7}{8}, -\frac{5}{8})$**

The coordinates of point Y are given. The midpoint of \overline{XY} is $(3, -5)$. Find the coordinates of point X .

11. $Y(0, 2)$ **$(6, -12)$** 12. $Y(-10, 5)$ **$(16, -15)$** 13. $Y(7, 1)$ **$(-1, -11)$**
 14. $Y(4, -8)$ **$(2, -2)$** 15. $Y(-1, -9)$ **$(7, -1)$** 16. $Y(2.5, -6.5)$ **$(3.5, -3.5)$**

Find the distance between each pair of points. If necessary, round to the nearest tenth.

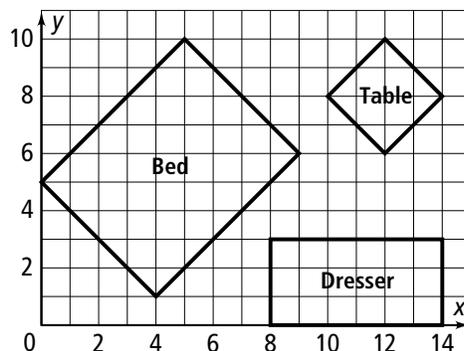
17. $A(6, 7), B(-1, 7)$ **7** 18. $C(5, -5), D(5, 3)$ **8**
 19. $E(-1, 0), F(12, 0)$ **13** 20. $Q(2, -6), T(10, 0)$ **10**
 21. $H(20, -4), I(-4, 3)$ **25** 22. $J(-5, 5), K(-3, -2)$ **7.3**

The room shown below right is 14 ft by 10 ft. Find the dimensions of each piece of furniture to the nearest tenth.

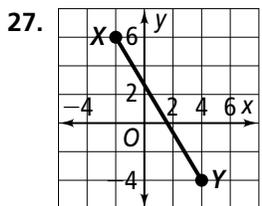
23. length and width of the dresser **6 ft \times 3 ft**
 24. length and width of the table **2.8 ft \times 2.8 ft**
 25. length and width of the bed **7.1 ft \times 5.7 ft**

26. **Reasoning** The midpoint of \overline{AB} is on the y -axis, and \overline{AB} is parallel to the x -axis. Point A is located in Quadrant III. Which quadrant contains point B ? Explain.

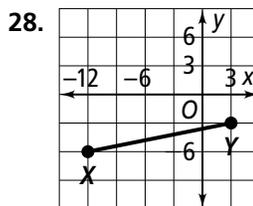
IV; Answers may vary. Sample: Suppose A is at $(-4, -5)$, which is a point in Quadrant III. Then B will be on the opposite side of the y -axis at $(4, -5)$ in Quadrant IV.



For each graph, find (a) XY to the nearest tenth and (b) the coordinates of the midpoint of \overline{XY} .



- a. 11.7
b. (1, 1)



- a. 15.3
b. $(-\frac{9}{2}, -\frac{9}{2})$

29. **Coordinate Geometry** Graph the points $A(0, 0)$, $B(3, 3)$, $C(9, 3)$, and $D(12, 0)$. Draw trapezoid $ABCD$ and diagonals \overline{AC} and \overline{BD} . Add point $E(6, 2)$ at the intersection of diagonals \overline{AC} and \overline{BD} .

- Find BE and CE . What do you notice? $BE = CE$
- Find AE and DE . What do you notice? $AE = DE$
- Make a Conjecture** What appears to be true about the diagonals of a trapezoid? **They divide each other into congruent segments.**

30. **Open-Ended** Point $B(-3, -3)$ is the endpoint of many segments.

- Find the coordinates of the midpoint and the other endpoint of four noncollinear segments that have point B as their endpoint.
Answers may vary.
- You know that a segment with endpoint B lies entirely in Quadrant III. What does that tell you about the other endpoint?
The other endpoint is in Quadrant III.
- How many possible segments parallel to either the y -axis or the x -axis match this description? Explain.
Infinitely many; answers may vary; sample: A segment parallel to the x -axis can extend any distance to the left without crossing the y -axis.

31. The plan at the right shows three storage closets in an apartment building. Find the center of each closet and the length of the closet's diagonal to the nearest tenth of a foot. (*Hint: The diagonals bisect each other, so the center is the midpoint of each diagonal.*)

- closet 1 **(2.5, 6.5); 7.1 ft**
- closet 2 **(8.5, 7); 5 ft**
- closet 3 **(4.5, 1.5); 9.5 ft**

