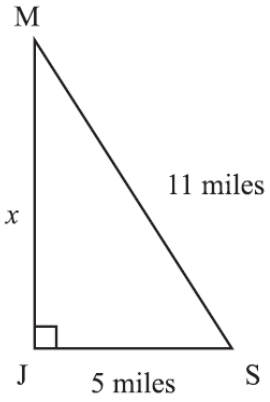
Algebraic Connections *Name:* _____

Practice for Pythagorean Theorem, Midpoint and Distance Formulas – Units C.1 and C.2

*Please **show your work** or you **will not get credit** for doing this.*

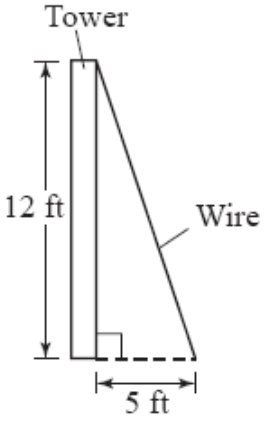
1. Students in a geometry class are learning to use triangles to calculate distances. In the figure below, the vertices J, M, and S represent the homes of Jason, Maurice, and Shanna, respectively.



How far does Jason live from Maurice, to the nearest tenth of a mile?

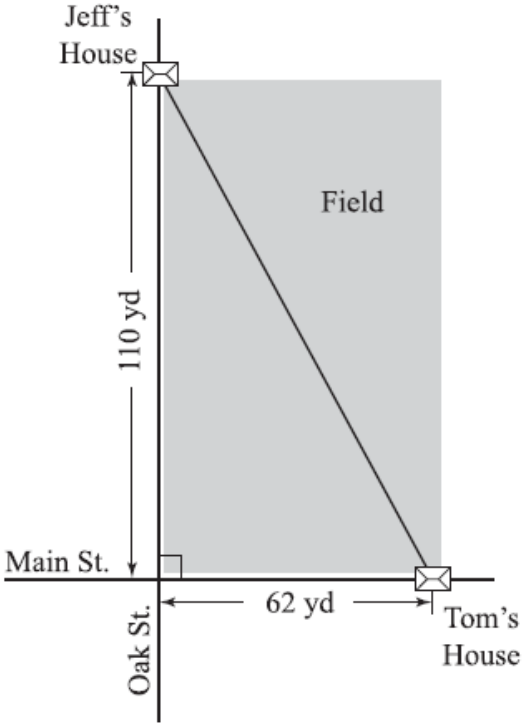
A. 6.0 miles
C. 9.8 miles
B. 12.0 miles
D. 16.0 miles

2. A 12-foot tower is to be anchored by a wire running from the top of the tower to a point 5 feet from the bottom of the tower. What is the length of the wire?



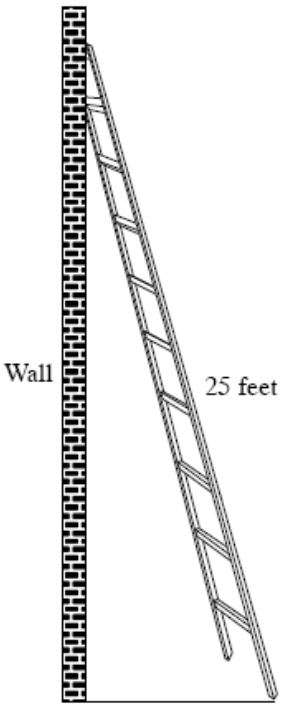
A. 13 ft
C. 17 ft
B. 34 ft
D. 169 ft

3. Jeff lives on Oak Street, and Tom lives on Main Street. How much farther, to the nearest yard, is it for Tom to walk down Main Street and turn on Oak Street to get to Jeff's house than if he travels the shortest distance between the houses through an empty field?



A. 46 yd
C. 48 yd
B. 126 yd
D. 172 yd

Use the figure below to answer question 4.

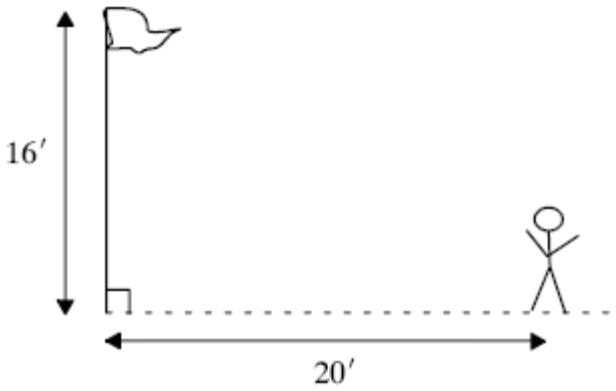


(Not drawn to scale.)

4. A 25-foot rescue ladder rests against a building. The base of the ladder is 7 feet away from the building. How high can the ladder reach on the wall?

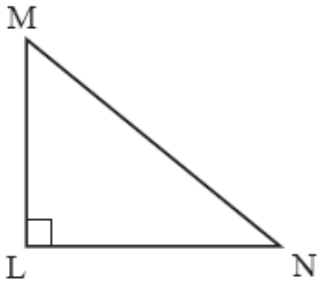
A. 12 ½ feet
C. 16 feet
B. 18 feet
D. 24 feet

5. Using the figure shown below, what is the most accurate measurement of the distance from the top of the flagpole to the spot where Jack is standing?



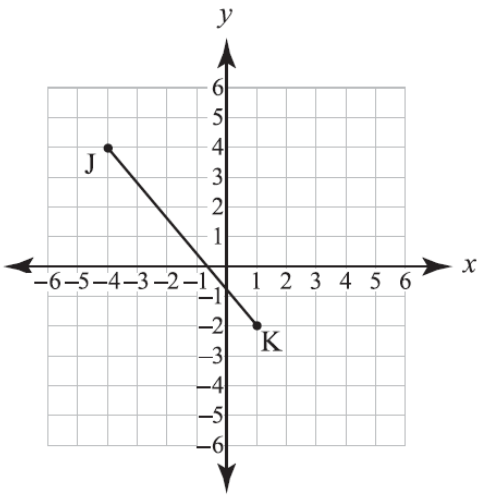
A. $25\frac{1}{2}$ feet
C. 36 feet
B. 320 feet
D. 656 feet

6. Given ΔLMN below, $\angle L$ is a right angle. Segment LN is 21 cm and $\overline{MN}$ is 28 cm. What is the length of $\overline{LM}$, to the nearest centimeter?



A. 7 cm
C. 19 cm
B. 35 cm
D. 49 cm

7. What are the coordinates of the midpoint of $\overline{JK}$ in the graph below?



A. $(-3,2)$
C. $(-2,2)$
B. $\left(-\frac{3}{2},1\right)$
D. $\left(-\frac{5}{2},3\right)$

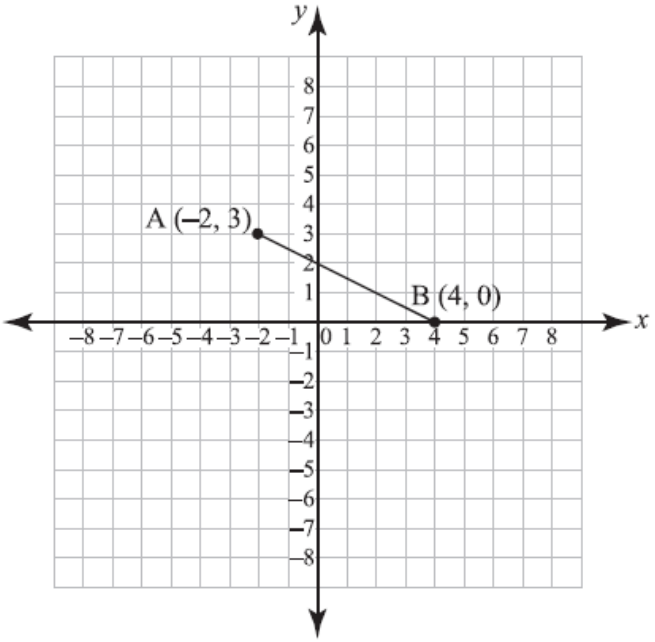
8. What is the midpoint of a segment with endpoints of (–3, 5) and (8, –17)?

A. (3, –6)
C. (5, –12)
B. (2.5, –6)
D. (–5.5, –9.5)

9. The coordinates of point A are (–2, 3). The coordinates of the midpoint of $\overline{AB}$ are (6, 1). What are the coordinates of point B?

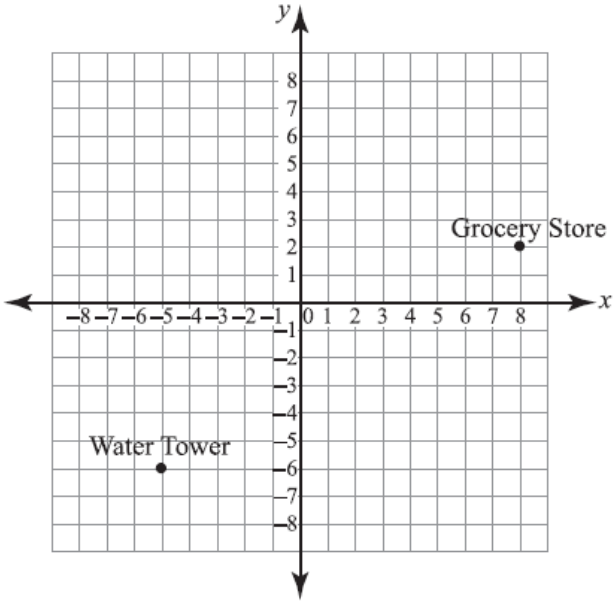
A. (2, 2)
C. (4, –1)
B. (–4, 2)
D. (14, –1)

10. What is the midpoint of $\overline{AB}$ below?



A. (1, 1.5)
C. (3, 1.5)
B. (2, 2)
D. (2, 3)

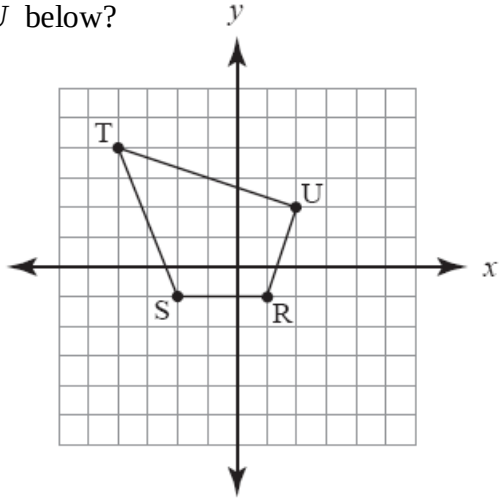
11. The city of Jefferson's system of street blocks is shown below.



Rounded to the nearest tenth, what is the distance from the water tower to the grocery store?

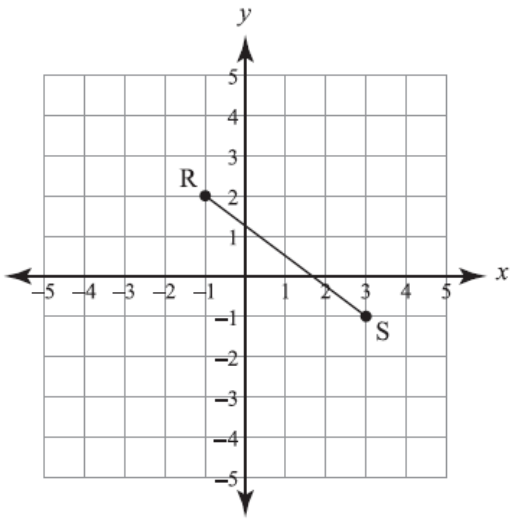
A. 10.2
C. 15.3
B. 21.0
D. 25.0

12. What are the coordinates for the midpoint of $\overline{TU}$ below?



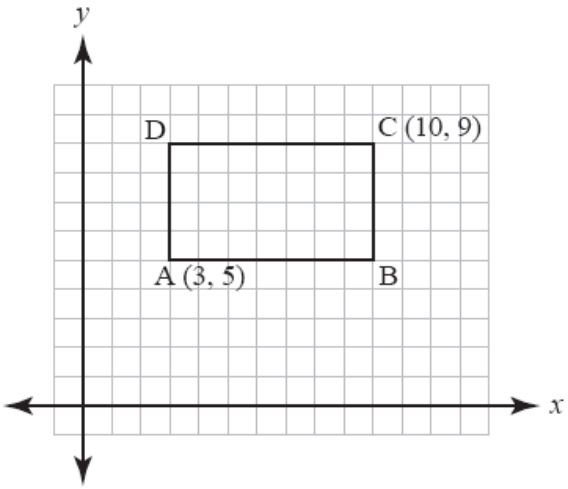
A. (–3, 1)
C. (–2, 6)
B. (–1, 3)
D. (3, –1)

13. What is the length of $\overline{RS}$ on the graph below?



A. $\sqrt{5}$
C. 5
B. 7
D. 25

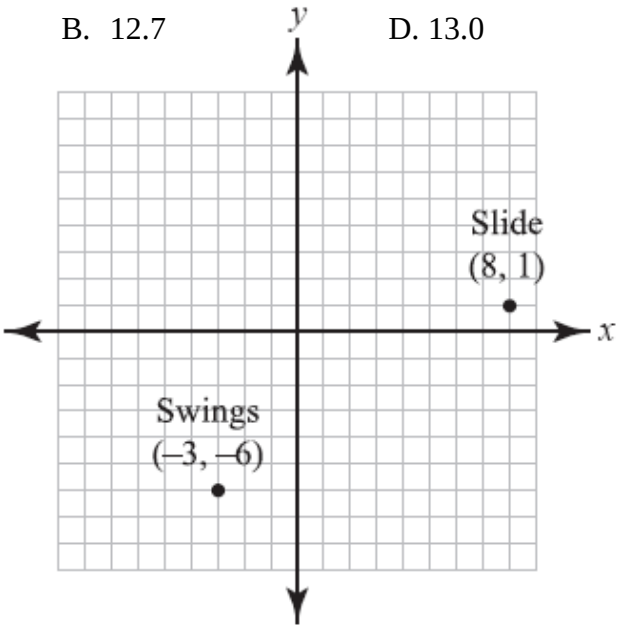
14. The graph below represents the floor of a new building. A straight electric cable will be placed from A to C. What is the length of the electric cable to the nearest tenth unit?



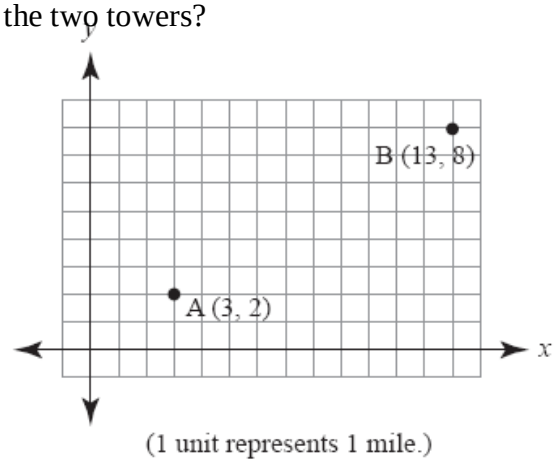
A. 5.8 units
C. 8.1 units
B. 13.5 units
D. 19.1 units

15. Tim made a graph of the location of some playground equipment as shown below. What is the distance between the swings and the slide to the nearest tenth of a unit?

A. 7.1
C. 7.6
B. 12.7
D. 13.0



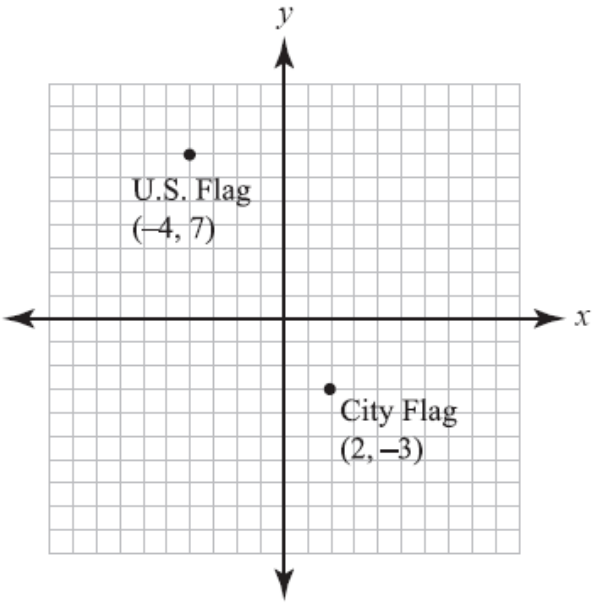
16. Points A and B on the graph below represent the location of two radio towers. Which is the nearest approximation of the distance between the two towers?



(1 unit represents 1 mile.)

A. 8 miles
C. 10 miles
B. 12 miles
D. 16 miles

Use the figure below to answer question 16.



17. The figure above shows the location of two flags on the city's courthouse grounds. The state flag will be located at the midpoint between the U.S. flag and the city flag. At which point will the state flag be located?

A. $\left(-\frac{11}{2},\frac{5}{2}\right)$ C. $(-3,5)$

B. $(-1,2)$ D. $\left(\frac{3}{2},-\frac{1}{2}\right)$

18. The point (1, 2) is the midpoint of a line segment whose one endpoint is (–3, 6). What is the other endpoint of the line segment?

A. (–7, 10) C. (–1, 4)

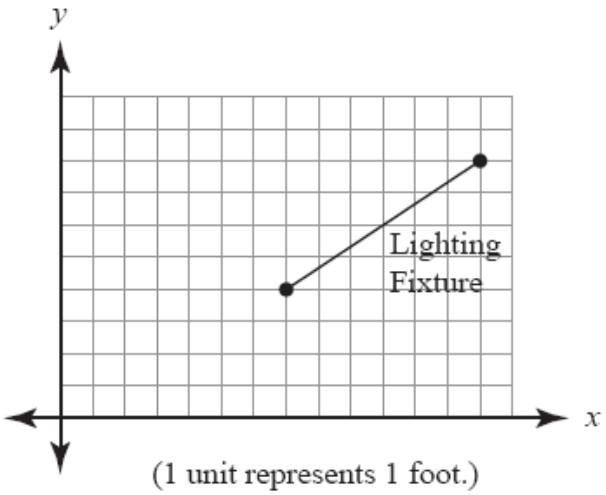
B. (4, – 4) D. (5, –2)

19. What is the midpoint of AB shown if A is $(-3,4)$ and $(6,-2)$?

A. $\left(-\frac{9}{2},3\right)$ C. $\left(\frac{3}{2},1\right)$

B. (3, 2) D. $\left(\frac{9}{2},-3\right)$

Use the graph below to answer question



20. A designer plotted a map of a client's home. In one room she placed a lighting fixture as shown on the graph above. How long is this fixture to the nearest tenth of a foot?

A. 5.8 feet B. 7.2 feet

B. 9.1 feet C. 10.2 feet