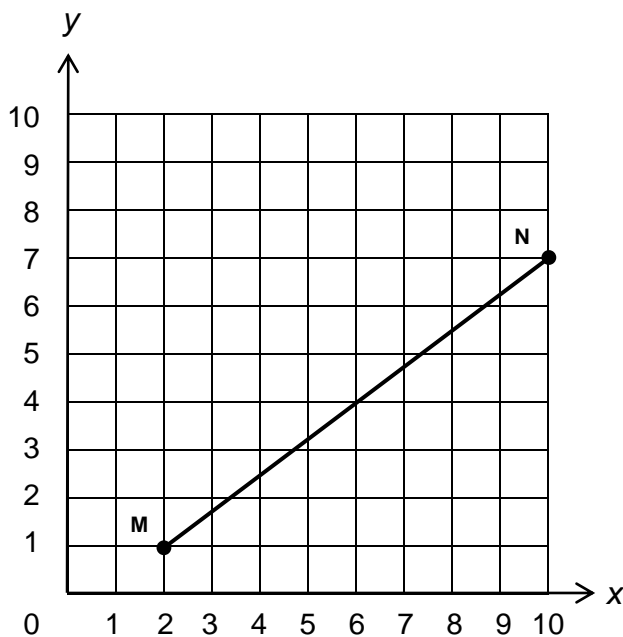


1. Look at  $\overline{MN}$  on the coordinate plane.



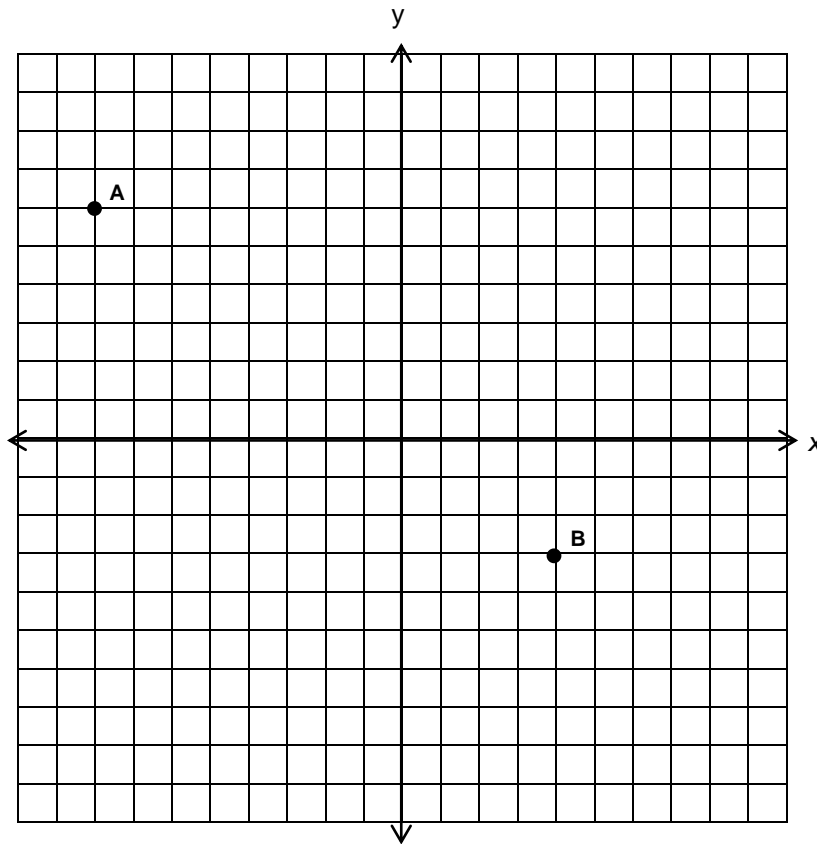
What is the distance between the endpoints of  $\overline{MN}$ ?

- A 5 units
- B 6 units
- C 8 units
- D 10 units

2. A parking lot is shaped like a square. The length of each side is 50 feet. What is the length of the diagonal of the parking lot?

- A  $\sqrt{100}$  feet
- B  $\sqrt{200}$  feet
- C  $\sqrt{5,000}$  feet
- D  $\sqrt{10,000}$  feet

3. What is the distance between Point A and Point B shown below?

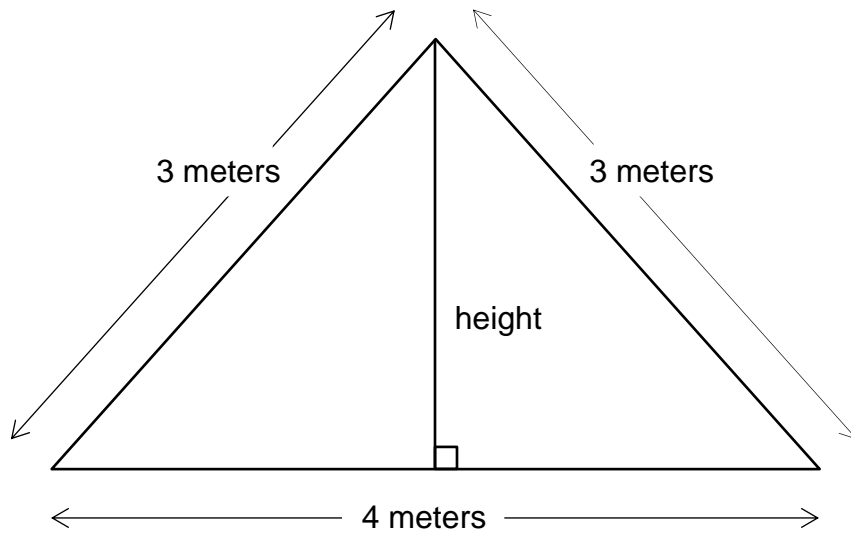


- A 5 units
- B 12.4 units
- C 15 units
- D 18 units

4. Points  $(-1, 8)$  and  $(3, 5)$  lie on a coordinate plane. What is the distance between the two points?

- A  $\sqrt{7}$
- B 5
- C  $\sqrt{85}$
- D 25

5. The diagram below represents the roof of a house.



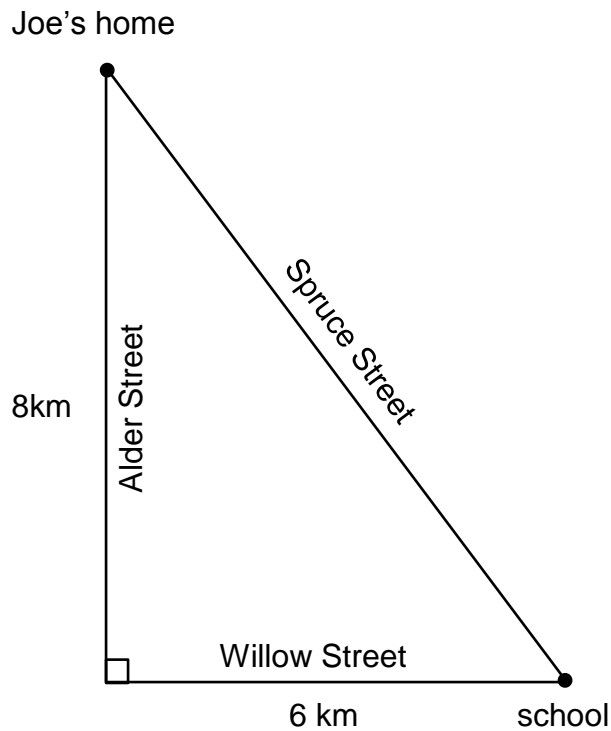
What is the height of the roof in meters?

- A 2 meters
- B  $\sqrt{5}$  meters
- C 7 meters
- D  $\sqrt{13}$  meters

6. Grace hiked 20 kilometers south and then 15 kilometers east. How far is Grace from the starting point of her hike?

- A 14.1 km
- B 17.5 km
- C 25.0 km
- D 35.0 km

7. The diagram below shows the streets from Joe's home to school.



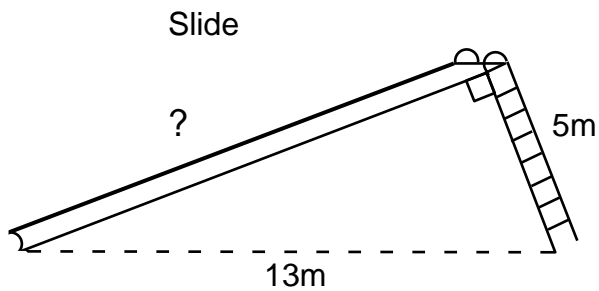
Joe is going to bike to school along Spruce Street. What is the distance Joe will bike?

- A 8 km
- B 10 km
- C 28 km
- D 50 km

8. A right triangle's hypotenuse has length 5. If one leg has length 2, what is the length of the other leg?

- A 3
- B  $\sqrt{21}$
- C  $\sqrt{29}$
- D 7

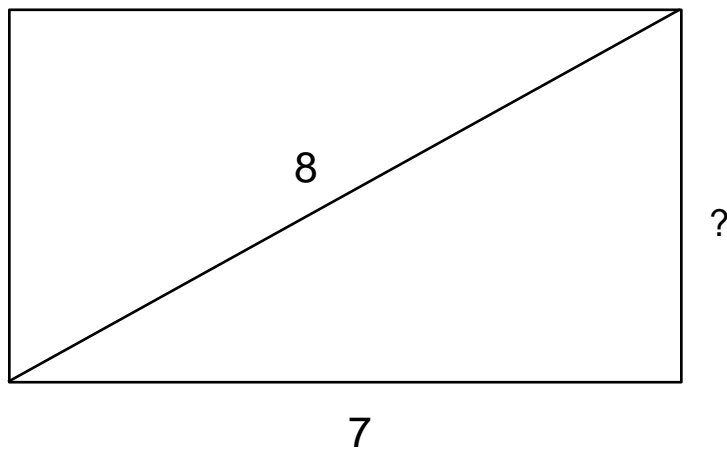
9. A right angle is made where the top of a ladder meets the top of a slide as shown in the picture below.



What is the length of the slide?

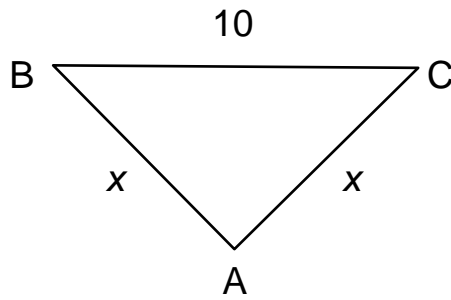
- A  $\sqrt{8}$  meters
- B 8 meters
- C 12 meters
- D  $\sqrt{194}$  meters

10. What is the height of this rectangle?



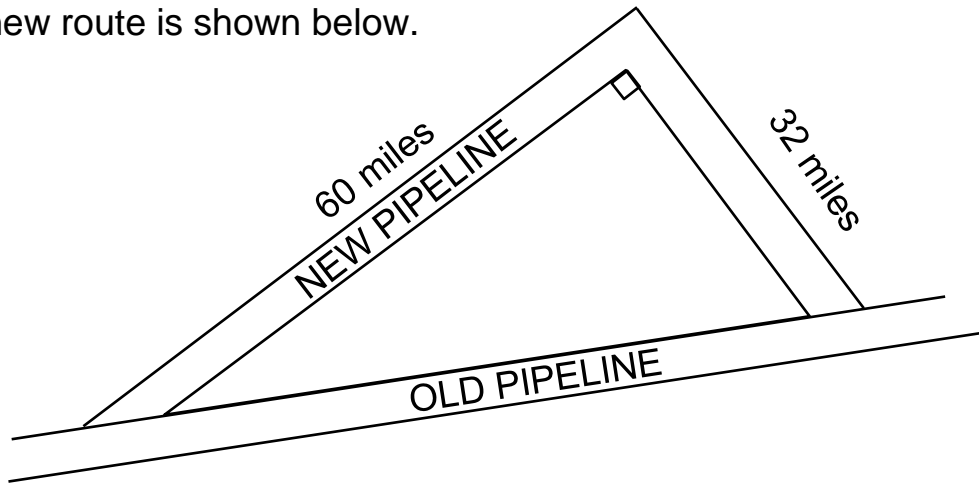
- A 1 unit
- B 6 units
- C  $\sqrt{15}$  units
- D  $\sqrt{113}$  units

11. What is the value of  $x$  in the triangle below?



- A 5
- B  $5\sqrt{2}$
- C  $10\sqrt{3}$
- D 20

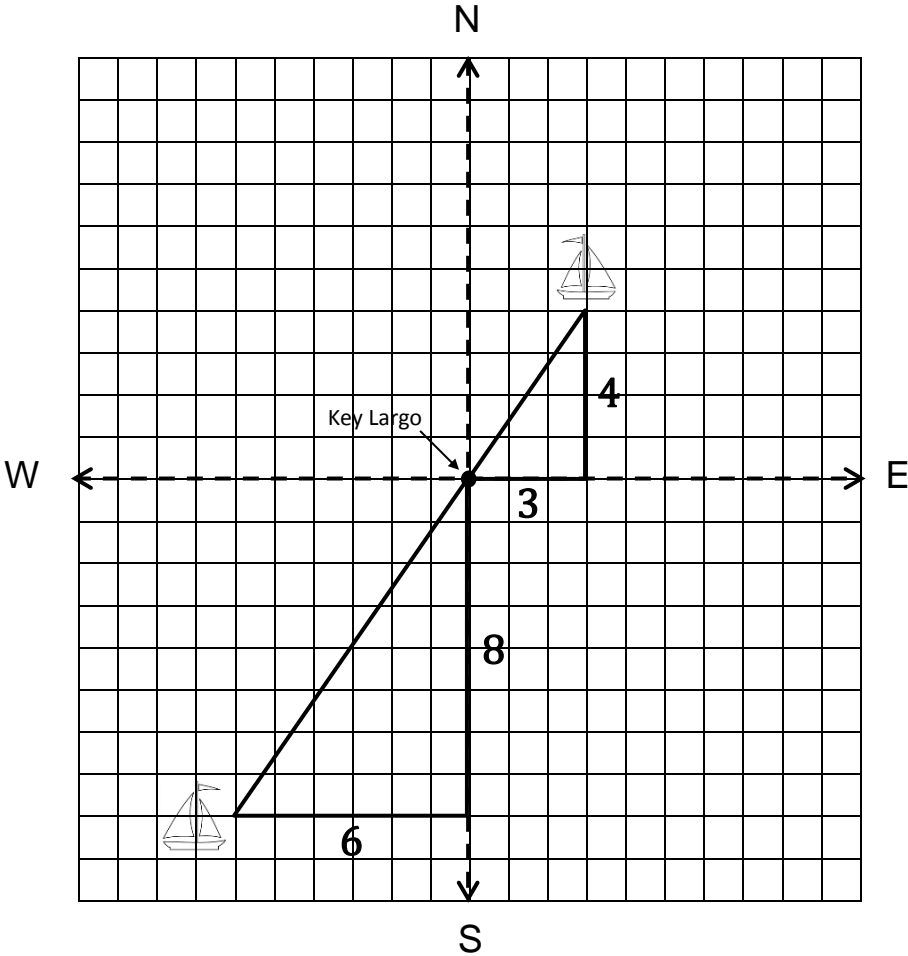
12. A new pipeline is being constructed to re-route its oil flow around the exterior of a national wildlife preserve. The plan showing the old pipeline and the new route is shown below.



About how many extra miles will the oil flow once the new route is established?

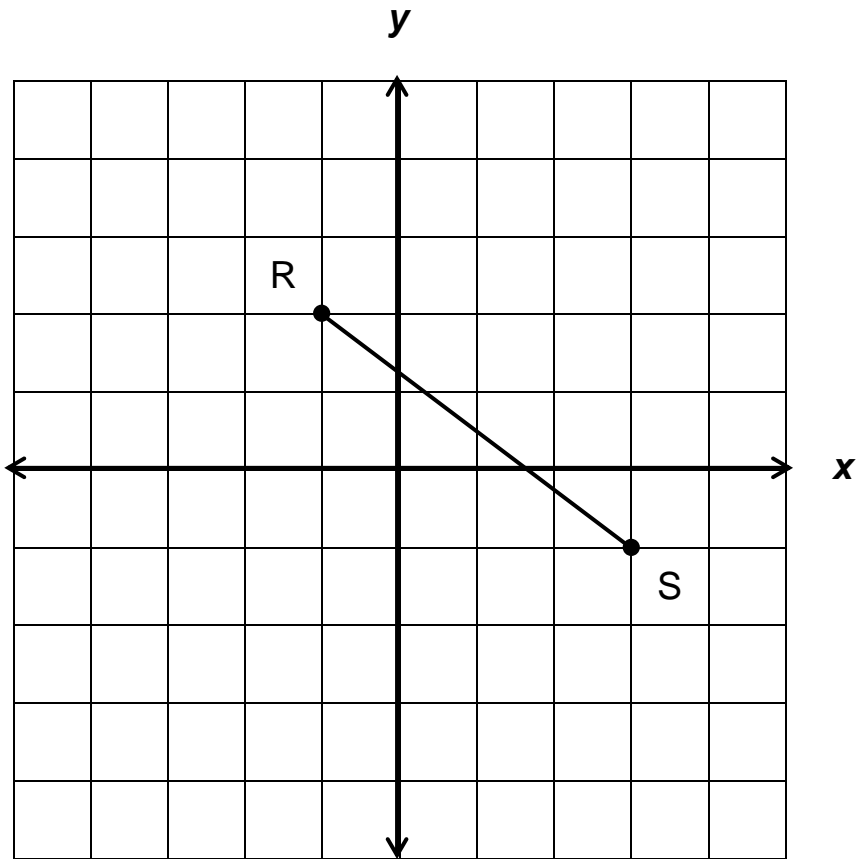
- A 24
- B 68
- C 92
- D 160

13. Two sailboats leave Key Largo, Florida. One of the sailboats travels 3 miles east and then 4 miles north. The second sailboat travels 8 miles south and 6 miles west.



How far apart, in miles, are the boats?

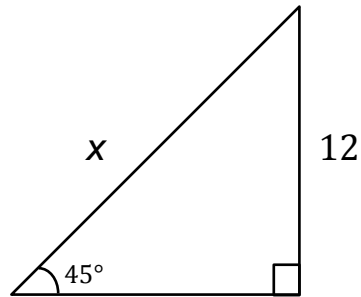
14. What is the length of RS on the graph below?



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

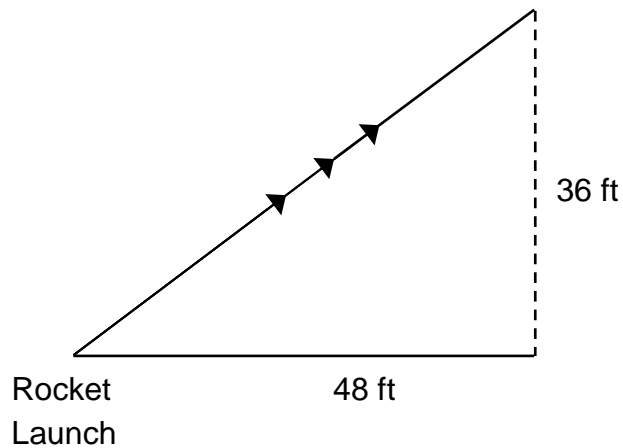


15. What is the value of  $x$  for the triangle below?



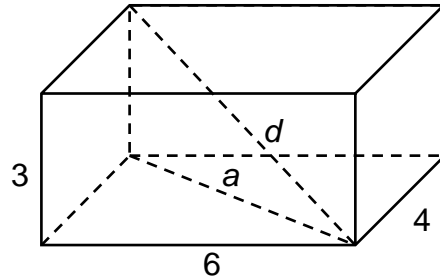
- A  $\sqrt{2}$
- B  $12\sqrt{2}$
- C  $12\sqrt{3}$
- D 24

16. A model rocket is launched. It rises to a point 36 feet above the ground, and is 48 feet along the ground from the lift-off site, as shown below. What is the length of the rocket's path in the air, to the nearest foot?



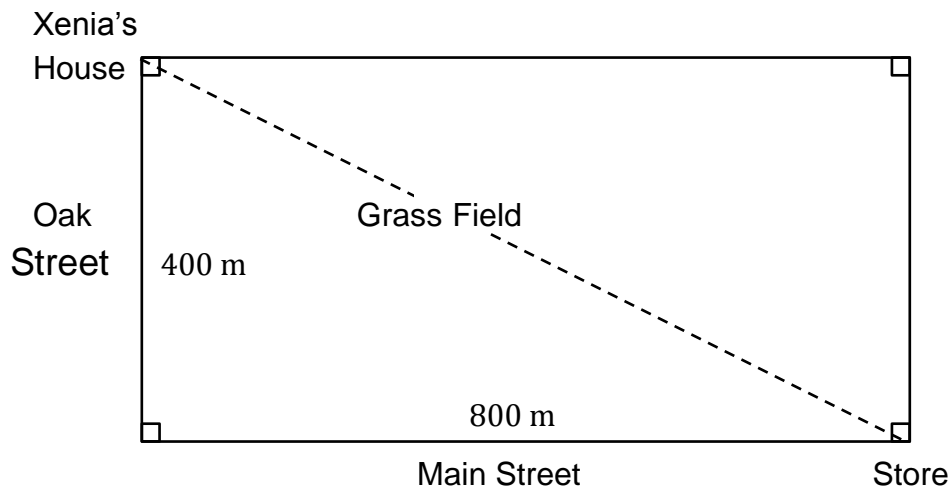
- A 12 ft
- B 32 ft
- C 60 ft
- D 84 ft

17. The figure below is of a rectangular prism.



1. What is the length of diagonal  $a$ ? Show all of your work and explain your answer.
2. Draw the triangle that is formed by diagonals  $a$  and  $d$ . Label all the known sides and measurements of the triangle.
3. What is the length of  $d$ , a diagonal of the prism? Show all of your work and explain your answer.

18. Xenia needs to get from her house to the store. Since she is in a hurry, she wants to cut diagonally across the grass field.



Approximately how many meters will Xenia walk if she goes this way?

- A 35 m
- B 894 m
- C 1,200 m
- D 400,000 m

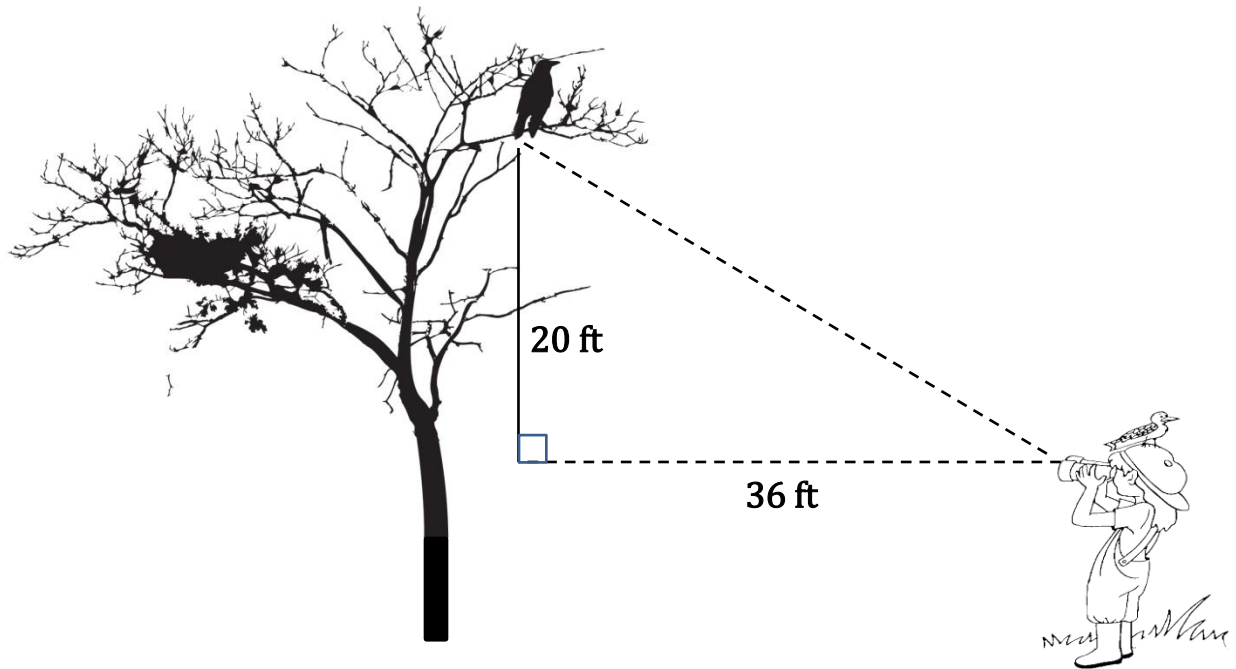
Okay, so we can use our calculator and our knowledge of the Pythagorean Theorem to find the answer, 894 meters. But honestly, we can answer this problem without using a calculator.

Why can't the answer be A?

Why can't the answer be C?

Why can't the answer be D?

19. Maria is observing a bird near the top of a tree, as shown in the diagram below.

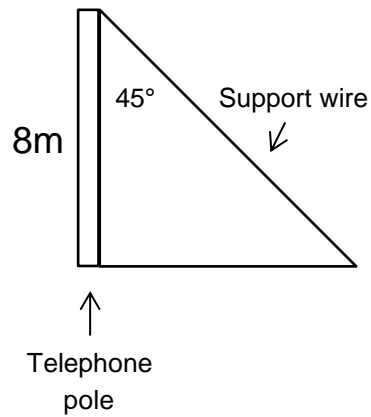


What is the distance between Maria and the bird?  
Show all of your work, and round to the nearest foot.

20. What is the distance between the points with coordinates (10, 3) and (2, -1)?

- A  $\sqrt{68}$  grid units
- B  $\sqrt{80}$  grid units
- C  $\sqrt{82}$  grid units
- D  $\sqrt{122}$  grid units

21. A support wire for a telephone pole will be dropped from the top of the pole to the ground at an angle of  $45^\circ$ .



How long must the wire be? Round your answer to the nearest tenth.

- A 6.9 m
- B 11.3 m
- C 13.9 m
- D 16.0 m