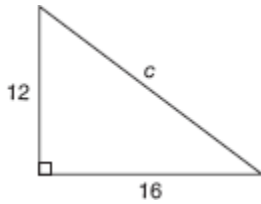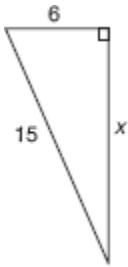Write an equation to determine the unknown side. Then, solve the equation. Simplify your answer.

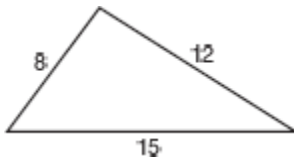**1.**

2.

3. A 12-foot ladder is set up 5 feet from the base of a building. How far up the building does the ladder reach? Round your answer to the nearest tenth of a foot.

4. Use the converse of the Pythagorean Theorem to determine if the triangle is a right triangle. Explain your answer.

5. Determine the distance between (−3, 1) and (5, −6) by graphing and connecting the points, creating a right triangle, and applying the Pythagorean Theorem.
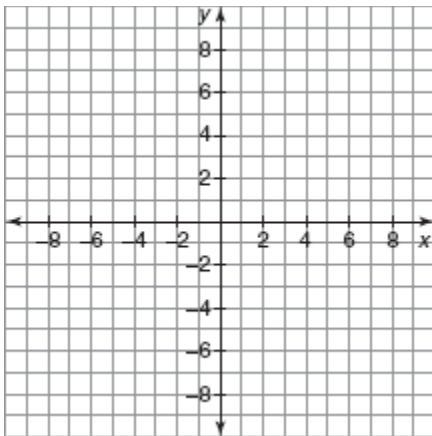
6. Rectangle *ABCD* has a length of 18 centimeters and a width of 10 centimeters. What is the length of diagonal *AC*?

7. The side lengths of a right triangle are 10, 24, and 26. Determine which is the length of the hypotenuse. Explain your reasoning.

Determine whether the given side lengths form a right triangle.

8. 5, 8, 17

9. A rectangular pool measures 20 meters by 30 meters. Mr. Jeffries wants to stretch a line from the northwest corner of the pool to the southeast corner. How many meters of line does he need? Round your answer to the nearest tenth of a meter.

20 m

30 m
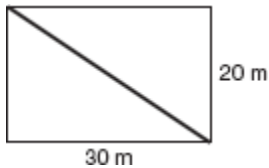
10. Tim and Holly left base camp and hiked 6 kilometers north, turned due west, and hiked 8 kilometers. They stopped and ate lunch. After lunch, they returned to base camp by hiking in a straight line. How many kilometers did they hike after lunch?

11. An 18-foot board is leaning against a wall. It is set 6 feet from the base of the wall. How far up the wall does the board reach? Round your answer to the nearest tenth of a foot.
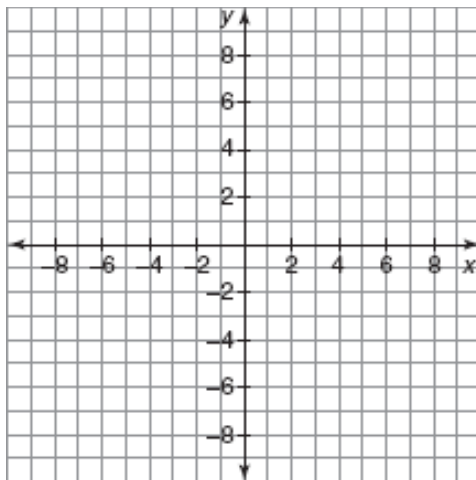
Determine the distance between each pair of points by graphing and connecting the points, creating a right triangle, and applying the Pythagorean Theorem.
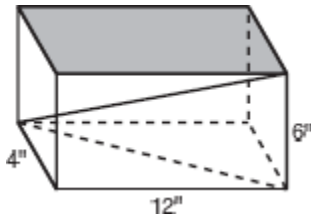
12. (−4, 2) and (4, −6)
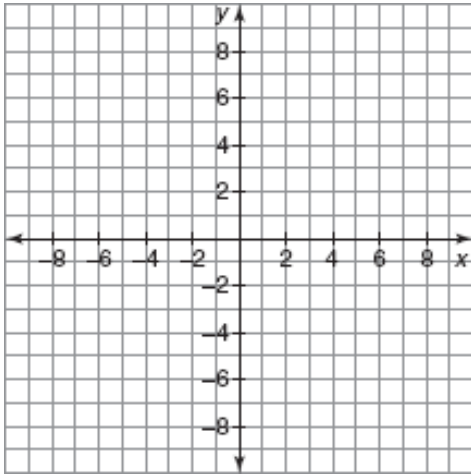
13. Trapezoid *ABCD* is formed by *A*(1, 3), *B*(8, 3), *C*(5, 6), and *D*(1, 6).

    a.   Graph and label the coordinates of trapezoid *ABCD*.

   **b.**   Draw diagonal *AC* in trapezoid *ABCD*. Then, determine its length.

    c.   Draw diagonal *BD* in trapezoid *ABCD*. Then, determine its length.

14. A rectangular box is 12 inches in length, 4 inches in width, and 6 inches in height.


    a.   Suppose the three-dimensional diagonal is also the hypotenuse of a right triangle. If a vertical edge is one of the legs of that right triangle, what is the length of the second leg?

    b.   Determine the length of the three-dimensional diagonal.

15. Jimmy is installing a gravel path along the diagonal of a rectangular garden. The garden measures 24 feet wide by 32 feet long. If the path is 2 feet wide, and gravel costs $3.50 a square foot, how much will it cost to install the gravel path?

16. Brianna is planting a sapling. The garden center recommended she stabilize the sapling with guy wires for the first few months after planting. If Brianna places the guy wires 6 feet up the trunk of the sapling and 5 feet from the base, how much total wire, to the nearest tenth of a foot, will she need for the two guy wires?
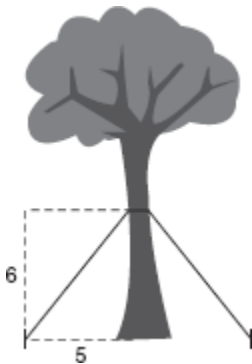
**17.** Trapezoid *ABCD* is shown. What is the length of diagonal *BD*?
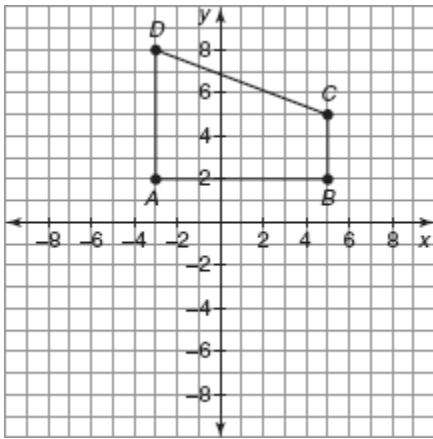
18. A right triangle is inscribed in a circle as shown. What is the area of the shaded region?

12 cm

9 cm
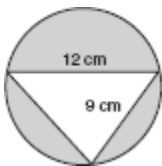
19. A painter props a ladder against a house. The base of the ladder is 12 feet from the house. The top of the ladder is 16 feet from the ground. How long is the ladder?

20.

Find the slant height of the regular pyramid.

18 cm

22 cm
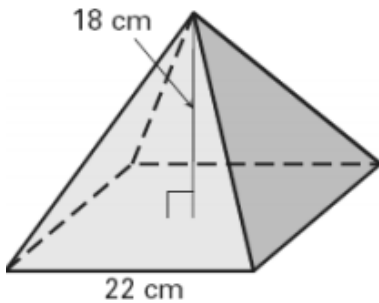
21. Find the height of the cone.

15 m

8 m