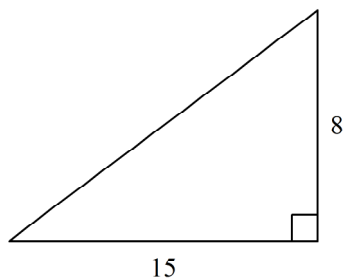


**Triangles & Trigonometry**

1. A right triangle has a hypotenuse length of 60, and one side length of 24. Do the side lengths form a Pythagorean triple? Explain.
2. A triangle has side lengths 12, 14, and 6. Is the triangle acute, obtuse, or right? Explain.
3. From the top of a 210-foot lighthouse located at sea level, the keeper spots a boat at an angle of depression of  $23^\circ$ .
  - a. Draw a sketch to represent this situation.
  - b. Use the angle of depression to find the distance from the base of the lighthouse to the boat. Explain your steps in finding the distance.
  - c. Use another angle to verify the distance you found in part (b). Explain your steps in finding the distance and tell why your method works.
  - d. Use the Pythagorean Theorem to find the shortest distance from the top of the lighthouse to the boat. Explain your steps in finding this distance.

**Find the length of the missing side. The triangle is not drawn to scale.**

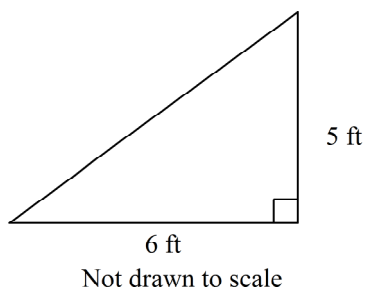
\_\_\_\_\_ 4.



- A. 120                      B. 46                      C. 289                      D. 17

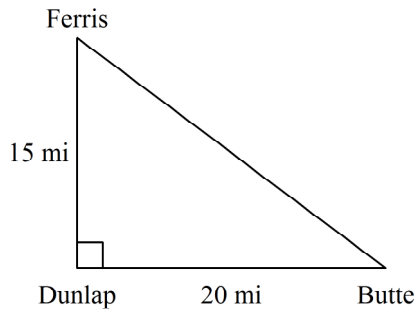
**Find the length of the missing side. Leave your answer in simplest radical form.**

\_\_\_\_\_ 5.



- Not drawn to scale
- A.  $\sqrt{61}$  ft                      B. 61 ft                      C.  $\sqrt{31}$  ft                      D.  $\sqrt{13}$  ft

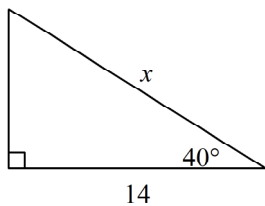
- \_\_\_\_\_ 6. Wayne used the diagram to compute the distance from Ferris, to Dunlap, to Butte. How much shorter is the distance directly from Ferris to Butte than the distance Wayne found?



- A. 20 mi                      B. 25 mi                      C. 10 mi                      D. 35 mi
- \_\_\_\_\_ 7. Quilt squares are cut on the diagonal to form triangular quilt pieces. The hypotenuse of the resulting triangles is 12 inches long. What is the side length of each piece?
- A.  $12\sqrt{2}$                       C.  $6\sqrt{2}$   
B.  $6\sqrt{3}$                       D. 6

**Find the value of  $x$ . Round to the nearest tenth.**

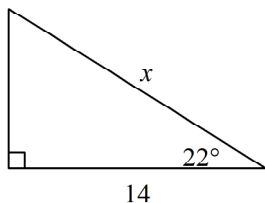
- \_\_\_\_\_ 8.



Not drawn to scale

- A. 18.5                      B. 10.8                      C. 18.3                      D. 10.7

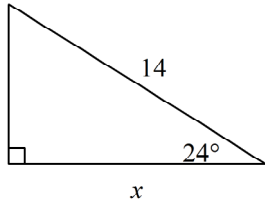
- \_\_\_\_\_ 9.



Not drawn to scale

- A. 13                      B. 13.1                      C. 15.2                      D. 15.1

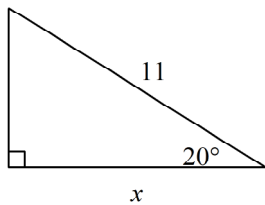
\_\_\_ 10.



Not drawn to scale

- A. 15.3                      B. 15.4                      C. 12.8                      D. 13.1

\_\_\_ 11.



Not drawn to scale

- A. 11.7                      B. 10.3                      C. 10.7                      D. 11.8

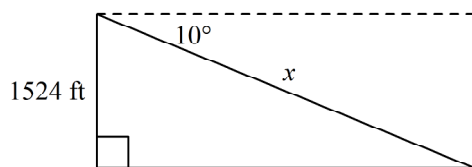
\_\_\_ 12. To find the height of a pole, a surveyor moves 140 feet away from the base of the pole and then, with a transit 4 feet tall, measures the angle of elevation to the top of the pole to be  $44^\circ$ . To the nearest foot, what is the height of the pole?

- A. 145 ft                      B. 149 ft                      C. 135 ft                      D. 139 ft

\_\_\_ 13. A spotlight is mounted on a wall 7.4 feet above a security desk in an office building. It is used to light an entrance door 9.3 feet from the desk. To the nearest degree, what is the angle of depression from the spotlight to the entrance door?

- A.  $39^\circ$                       B.  $51^\circ$                       C.  $53^\circ$                       D.  $37^\circ$

\_\_\_ 14. To approach the runway, a pilot of a small plane must begin a  $10^\circ$  descent starting from a height of 1524 feet above the ground. To the nearest tenth of a mile, how many miles from the runway is the airplane at the start of this approach?



Not drawn to scale

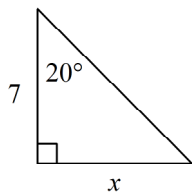
- A. 8,776.4 mi                      B. 0.3 mi                      C. 1.6 mi                      D. 1.7 mi

Name: \_\_\_\_\_

ID: A

Use a trigonometric ratio to find the value of  $x$ . Round your answer to the nearest tenth.

\_\_\_\_ 15.



Not drawn to scale

A. 2.5

B. 6.6

C. 19.2

D. 2.4