Geometry 7.1 & 7.2: Worksheet

Find the unknown lengths.

1. [Diagram]
   \[ 8 \quad x \]
   \[ \text{8 units}^2 \]

2. [Diagram]
   \[ \sqrt{6^2 + 3^2} = \sqrt{36 + 9} = \sqrt{45} = 3\sqrt{5} \text{ units}^2 \]

3. [Diagram]
   \[ 15^2 - 9^2 = 15 - 9 = 6 \text{ units}^2 \]

Find the area of the triangle.

4. [Diagram]
   \[ 10 \text{ in.} \quad 10 \text{ in.} \quad 16 \text{ in.} \]
   \[ h = 6 \]
   \[ \frac{16 \cdot 6}{2} = 48 \text{ in}^2 \]

Find the area of the right triangle. Write your answer in simplest radical form.

5. [Diagram]
   \[ 8 \text{ in.} \quad 12 \text{ in.} \]
   \[ \sqrt{12^2 - 8^2} = \sqrt{144 - 64} = \sqrt{80} = 4\sqrt{5} \]
   \[ A = \frac{4\sqrt{5} \cdot 8}{2} = 16\sqrt{5} \text{ in}^2 \]

6. [Diagram]
   \[ 20 \text{ ft} \quad 16 \text{ ft} \]
   \[ \sqrt{20^2 - 16^2} = \sqrt{400 - 256} = \sqrt{144} = 12 \text{ ft} \]

The given lengths are two sides of a right triangle. All three side lengths of the triangle are integers and together form a Pythagorean triple. Find the length of the third side and tell whether it is a leg or the hypotenuse.

7. 15 and 36
   \[ \sqrt{15^2 + 36^2} = \sqrt{225 + 1296} = \sqrt{1521} = 39 \]
   \[ \text{Hypotenuse} \]

8. 70 and 250
   \[ \sqrt{70^2 - 250^2} \]
   \[ \text{Leg} \]

9. 15 and 20
   \[ \sqrt{15^2 + 20^2} = \sqrt{225 + 400} = \sqrt{625} = 25 \]
   \[ \text{Hypotenuse} \]

10. Ladder A 20 foot ladder is resting against the side of a house. The base of the ladder is 4 feet away from the house. Approximately how high above the ground does the ladder touch the house?

   \[ 20 \text{ ft} \quad 4 \text{ ft} \]
   \[ \sqrt{20^2 - 4^2} = \sqrt{384} \approx 19.6 \text{ ft} \]
11. Find the area of a right triangle with given leg \( l \) and hypotenuse \( h \). Round decimal answers to the nearest tenth.

\[
\sqrt{l^2 - h^2} = 9
\]

\[
\frac{12 \times 9}{2} = 54 \text{ cm}^2
\]

Tell whether the triangle is a right triangle.

12.

13.

\[
15^2 + 20^2 = 25^2
\]

\[
\sqrt{625} = 25
\]

\[\text{YES}\]

Decide whether the numbers can represent the side lengths of a triangle. If they can, classify the triangle as acute, right, or obtuse.

14. 6, 8, 10

15. 5, 7, 9

16. 8, 9, 10

17. 10, 15, 5\sqrt{13}

18. 24, 30, 6\sqrt{43}