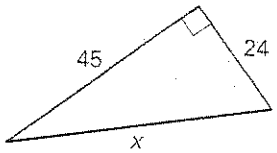
# Adv. Geometry 7.1 - Pythagorean Theorem Key

**Find the length of the hypotenuse of the right triangle. Write your answer in simplest radical form.**

1.

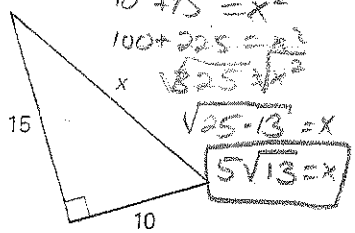



$24^2+45^2=x^2$

$\sqrt{2601}=\sqrt{x^2}$

$X=51$

2.




$10^2+15^2=x^2$

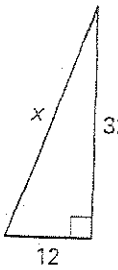
$100+225=x^2$

$\sqrt{325}=\sqrt{x^2}$

$\sqrt{25\cdot13}=x$

$5\sqrt{13}=x$

3.




$x^2=12^2+32^2$

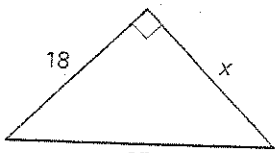
$\sqrt{x^2}=\sqrt{1168}$

$x=\sqrt{16\cdot73}$

$x=4\sqrt{73}$

**Find the unknown leg length *x*. Write your answer in simplest radical form.**

4.




$x^2+18^2=25^2$

$\sqrt{x^2}=\sqrt{301}$

$X=\sqrt{301}$

5.


$x^2+9^2=27^2$

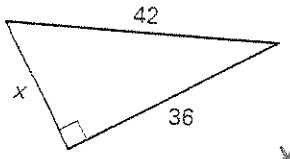
$x^2=648$

$X=\sqrt{648}$

$x=\sqrt{2\cdot324}$

$x=18\sqrt{2}$

6.




$x^2+36^2=42^2$

$x^2=468$

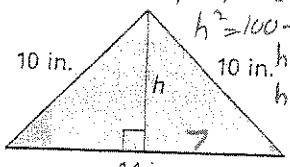
$x=\sqrt{468}$

$x=\sqrt{36\cdot13}$

$x=6\sqrt{13}$

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

7.




$h^2+7^2=10^2$

$h^2=100-49$

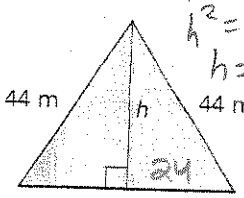
$h^2=51$

$h=\sqrt{51}$

$A=\frac{1}{2}(14)(\sqrt{51})$

$A=7\sqrt{51}$

8.




$h^2+24^2=44^2$

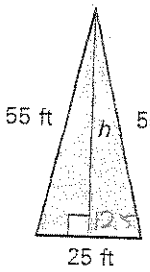
$h^2=1360$

$h=4\sqrt{85}$

$A=\frac{1}{2}(48)4\sqrt{85}$

$A=96\sqrt{85}$

9.




$h^2+12.5^2=85^2$

$h^2=2868.75$

$h=\sqrt{2868.75}$

$A=\frac{1}{2}(25)\sqrt{2868.75}$

$A=12.5\sqrt{2868.75}$

10. **Multiple Choice** What is the length of the hypotenuse of a right triangle with leg lengths of 21 inches and 28 inches?

**A.** 30 inches **B.** 35 inches **C.** 40 inches **D.** 42 inches

**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.**

11. 24 and 32

$24^2+32^2=x^2$

$1600=x^2$

$40=x$

hypotenuse

12. 24 and 45

$24^2+45^2=x^2$

$2601=x^2$

$51=x$

hypotenuse

13. 40 and 85

$40^2+85^2=x^2$

$\sqrt{8625}=x=93.9$

$40^2+x^2=85^2$

$\sqrt{x^2}=\sqrt{5625}$

$x=75$

Leg

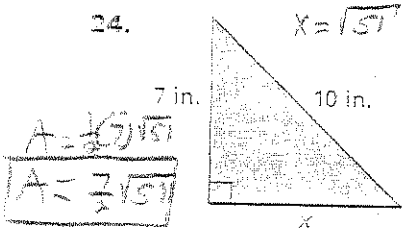
22. **Multiple Choice** One leg of a right triangle is twice as long as the other leg. The area of the triangle is 49 square feet. What is the length of the shorter leg?

A. 5 ft  B. 6 ft  C. 7 ft  D. 8 ft

$A = \frac{1}{2}(x)(2x)$
$49 = \frac{1}{2}2x^2$
$49 = x^2$  $x = 7$

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

24.

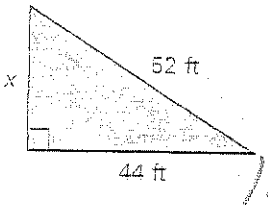



$x^2 + 7^2 = 10^2$
$x = \sqrt{51}$
$A = \frac{1}{2}(7)\sqrt{51}$
$A = \frac{7}{2}\sqrt{51}$

25.


$x^2 + 12^2 = 28^2$
$x^2 + 144 = 784$
$x^2 = 640$
$x = 8\sqrt{10}$
$A = \frac{1}{2}(12)(8\sqrt{10})$
$A = 48\sqrt{10}$

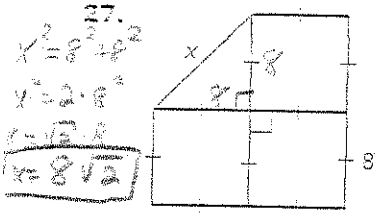
26.




$x^2 + 44^2 = 52^2$
$x^2 = 768$
$x = 16\sqrt{3}$
$A = \frac{1}{2}(16\sqrt{3})(44)$
$A = 352\sqrt{3}$

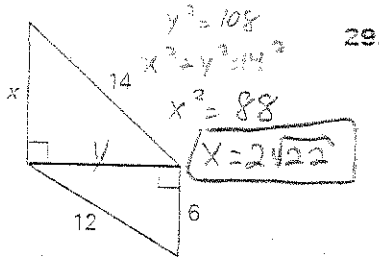
**Find the unknown side length x. Write your answer in simplest radical form.**

27.



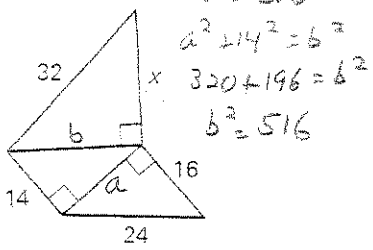

$x^2 = 8^2 + 8^2$
$x^2 = 2 \cdot 8^2$
$x = \sqrt{2} \cdot 8$
$x = 8\sqrt{2}$

28.




$y^2 + 6^2 = 12^2$
$y^2 = 108$
$x^2 = y^2 + 14^2$
$x^2 = 88$
$x = 2\sqrt{22}$

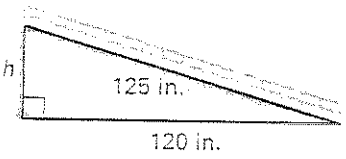
29.




$a^2 + 16^2 = 24^2$
$a^2 = 320$
$a^2 + 14^2 = b^2$
$320 + 196 = b^2$
$b^2 = 516$

$b^2 + x^2 = 32^2$
$516 + x^2 = 1024$
$x^2 = 508$
$x = 2\sqrt{127}$

30. **Ramp** A shipping dock has a mobile ramp that is used to help load and unload cargo from trucks. The ramp is 125 inches long and has a base that is 120 inches long. What is the height $h$ of the ramp?




$h^2 + 120^2 = 125^2$
$h^2 = 1225$
$h = 35$ inches