

Warm-upSolve for x .

1. $\sqrt{100} = \sqrt{x^2}$

$\sqrt{100} = x$

$10 = x$

2. $\sqrt{x^2} = \sqrt{24}$

$x = \sqrt{24}$

$2\sqrt{6} \approx 4.90$

Simplify.

3. $\sqrt{45}$

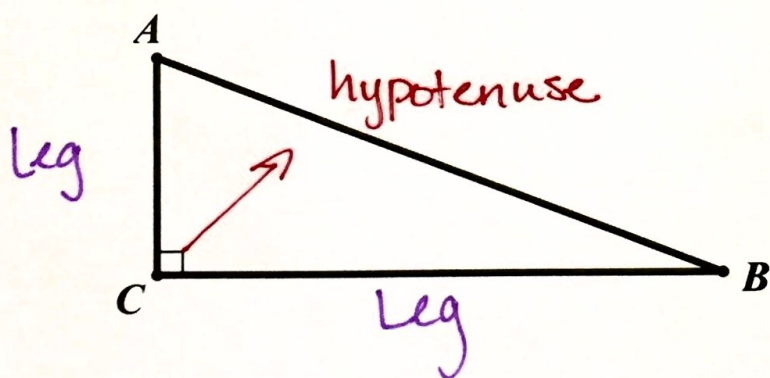
$3\sqrt{5} \approx 6.71$

$$\begin{array}{c} \uparrow \\ 9 \ 5 \\ \uparrow \ \uparrow \\ 3 \ 3 \end{array}$$

4. $\sqrt{121} = 11$

5. $\sqrt{135}$

$3\sqrt{15} \approx 11.62$

Label the sides of the right triangle as a leg or hypotenuse.

Leg: any side used
to form the
Right \angle

\overline{CA} \overline{CB}

hyp: the side
opposite the Right \angle

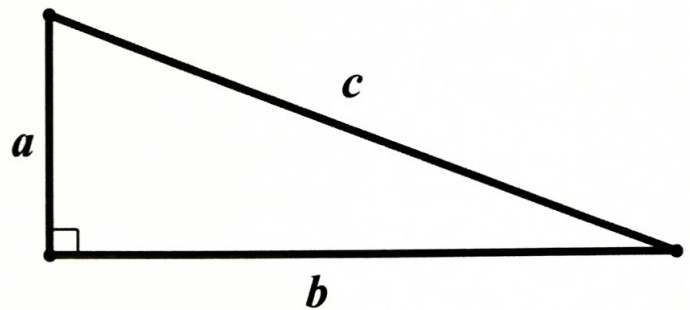
\overline{BA}

ALWAYS the
longest side

Pythagorean Theorem:

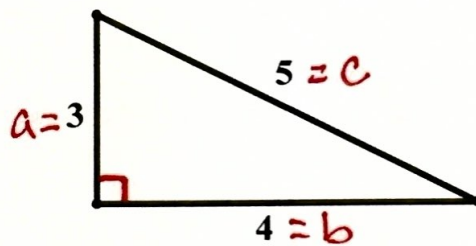
$$a^2 + b^2 = c^2$$

$$(\text{Leg})^2 + (\text{Leg})^2 = (\text{hyp})^2$$



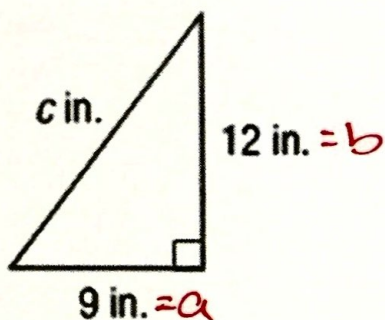
Ex. 1: Use the Pythagorean Theorem to verify that the following triangle is a right triangle.

$$\begin{aligned} a^2 + b^2 &= c^2 \\ 3^2 + 4^2 &\stackrel{?}{=} 5^2 \\ 9 + 16 &\stackrel{?}{=} 25 \\ 25 &= 25 \end{aligned}$$



Write an equation you could use to find the length of the missing side of each right triangle. Then find the missing length. Simplify the root.

Ex. 2:



$$a^2 + b^2 = c^2$$

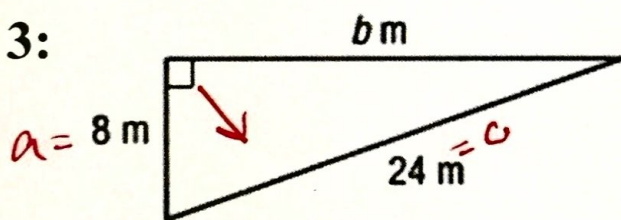
$$9^2 + 12^2 = c^2$$

$$81 + 144 = c^2$$

$$\sqrt{225} = \sqrt{c^2}$$

$$15 \text{ in} = c$$

Ex. 3:



$$a^2 + b^2 = c^2$$

$$8^2 + b^2 = 24^2$$

$$64 + b^2 = 576$$

$$\begin{array}{r} -64 \\ 64 + b^2 = 576 \\ \hline \end{array}$$

$$\sqrt{b^2} = \sqrt{512}$$

$$b = 16\sqrt{2} \approx 22.63 \text{ m}$$

Ex. 4: $a = 17 \text{ cm}$, $c = 20 \text{ cm}$

$$b = \sqrt{111} \approx 10.54 \text{ cm}$$

$$a^2 + b^2 = c^2$$

$$17^2 + b^2 = 20^2$$

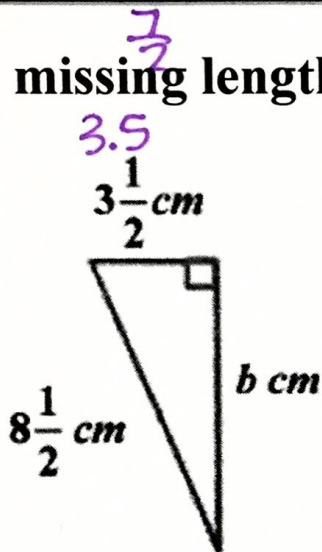
$$289 + b^2 = 400$$

$$\begin{array}{r} -289 \\ 289 + b^2 = 400 \\ \hline \end{array}$$

$$\sqrt{b^2} = \sqrt{111}$$

Find the missing length. Simplify the root.

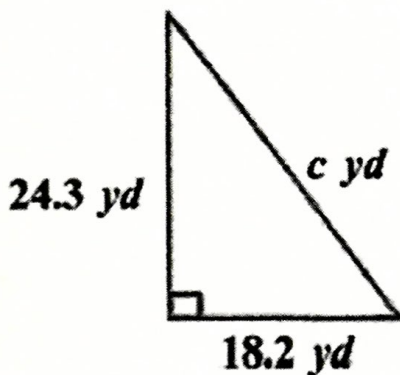
Ex. 5:



$$a^2 + b^2 = c^2$$

$$3.5^2 + b^2 = 8.5^2$$

Ex. 6:



Determine whether each triangle with sides of given lengths is a right triangle. Justify your answer.

Ex. 7: 3 in, 5 in, 7 in

$$a^2 + b^2 = c^2$$

$$3^2 + 5^2 \stackrel{?}{=} 7^2$$

$$9 + 25 \neq 49$$

Not a Right Δ

longest side
is c

Ex. 8: 5 m, 12 m, 13 m