

Trigonometry

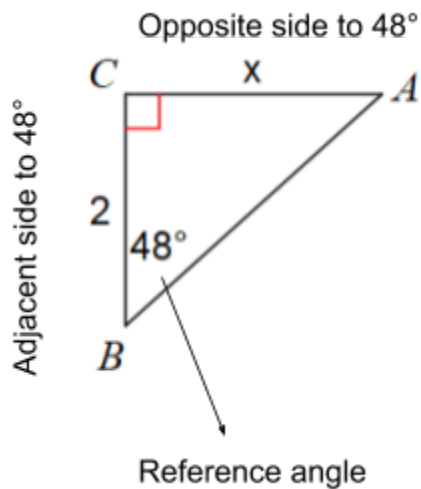
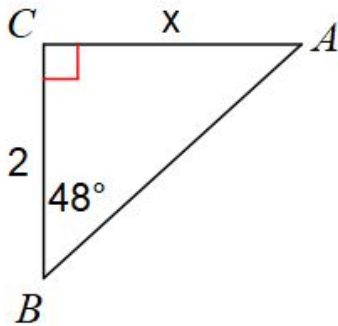
Finding a missing side in a right triangle given one angle and a side

- Label the side which is given (opposite, adjacent or hypotenuse)
- Label the side you need to find (opposite, adjacent or hypotenuse)
- Use $S\frac{O}{H}C\frac{A}{H}T\frac{O}{A}$ to determine the appropriate ratio (sine, cosine or tangent) based on the two sides you have labelled
- Write an equation for the ratio
- Cross-multiply and solve for the missing side

Examples: For each triangle solve for the measure of side x .

Question 1

Solution:



With OPPOSITE & ADJACENT WE USE $T\frac{O}{A}$

The equation will be $\tan 48^\circ = \frac{x}{2}$

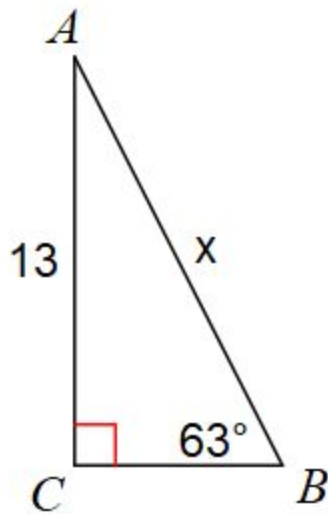
if we write this as a proportion we get:

$\frac{\tan 48^\circ}{1} = \frac{x}{2}$ and cross-multiplying we get...

$x = 2 \cdot \tan 48^\circ$ calculating we get....

$x = 2.22 \text{ units}$

Question 2



Solution

63° is the reference angle

13 is the “OPPOSITE SIDE”

x is the “HYPOTENUSE”

With Opposite & Hypotenuse we use $S\frac{O}{H}$

Equation: The equation will be $\sin 63^\circ = \frac{13}{x}$
if we write this as a proportion we get:

$$\frac{\sin 63^\circ}{1} = \frac{13}{x} \quad \text{and cross-multiplying we get...}$$

$$x \cdot \sin 63^\circ = 13 \quad \text{dividing by } \sin 63^\circ \text{ we get....}$$

$$x = \frac{13}{\sin 63^\circ} \quad \text{calculating we get...}$$

$$x = 14.59 \text{ units}$$