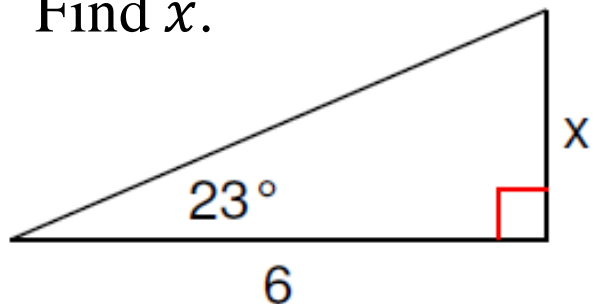


# Warm-up Problems

1) Find  $x$ .

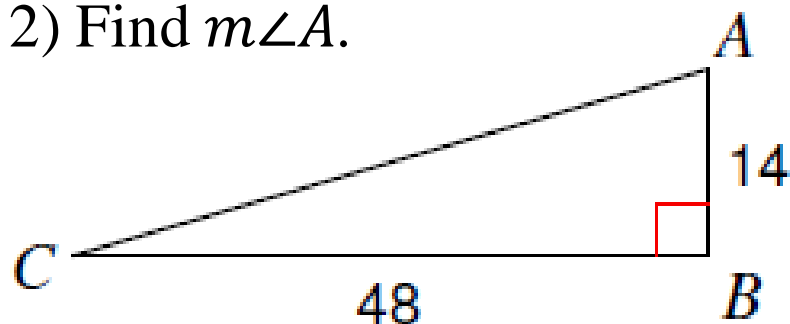


$$6 \cdot \tan 23 = \frac{x}{6} \cdot 6$$

$$6 \tan 23 = x$$

$$x = 2.5$$

2) Find  $m\angle A$ .



$$\tan A = \frac{48}{14}$$

$$A = 73.7$$

# Trigonometry

Def. Trigonometry is the study of the relationships between the angles and sides of a right triangle.

Def. A comparison of the lengths of two sides of a right triangle is called a trigonometric ratio. The three most common ratios of trigonometry are sine, cosine, and tangent.

Ex. Find  $\sin 38^\circ = .62$

$$\cos 38^\circ = .79$$

$$\tan 38^\circ = .78$$

Ex. Find  $x$  if  $\sin x = .394$   $x = 23.2$

$$\cos x = .5 \quad x = 60$$

$$\tan x = 3.525 \quad x = 74.2$$

Ex. Find  $x$  if  $\sin 24^\circ = \frac{x}{5}$

$$5 \sin 24 = x$$
$$x = 2.0$$

Ex. Find  $x$  if  $\cos 35^\circ = \frac{4}{x}$

$$x \cos 35 = 4$$

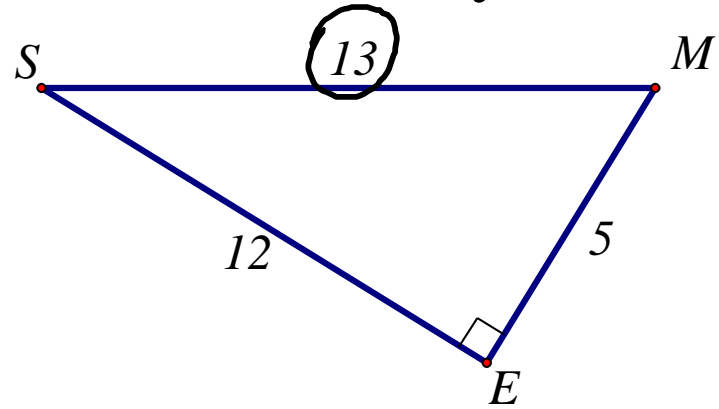
$$x = \frac{4}{\cos 35} = 4.9$$

In a right triangle, the trig ratios can be found by remembering

**S**OH    **C**AH    **T**OA

$$\sin x = \frac{\text{opp}}{\text{hyp}} \quad \cos x = \frac{\text{adj}}{\text{hyp}} \quad \tan x = \frac{\text{opp}}{\text{adj}}$$

Ex. Find  $\sin S$ ,  $\cos S$ , and  $\tan S$ . Write your answer as a fraction.



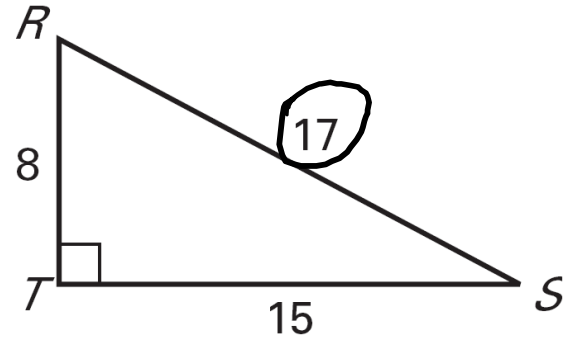
$$\sin S = \frac{5}{13}$$

$$\cos S = \frac{12}{13}$$

$$\tan S = \frac{5}{12}$$

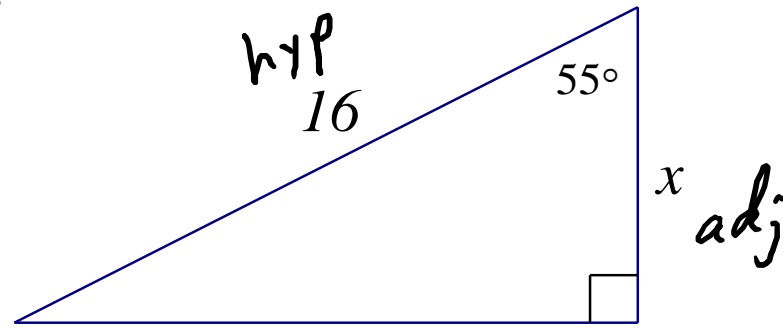
Pract. Find  $\sin R$ ,  $\cos R$ , and  $\tan R$ . Write your answer as a fraction.

$$\sin R = \frac{15}{17} \quad \cos R = \frac{8}{17} \quad \tan R = \frac{15}{8}$$



SOH CAH TOA

Ex. Find  $x$ .



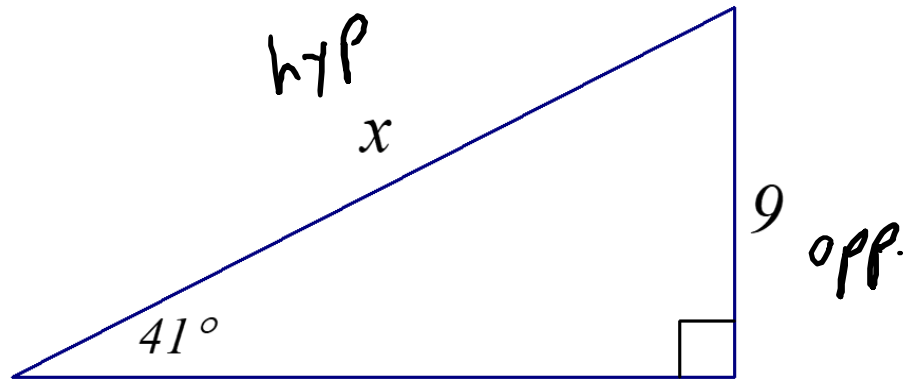
SOH CAH TOA  
↑

$$16 \cdot \cos 55 = \frac{x}{\cancel{16}} \cdot \cancel{16}$$

$$16 \cos 55 = x$$

$$x = 9.2$$

Ex. Find  $x$ .



SOH  
↑  
CAH TOA

$$x \cdot \sin 41 = \frac{9}{x} \cdot x$$

$$x \frac{\sin 41}{\sin 41} = \frac{9}{\sin 41}$$

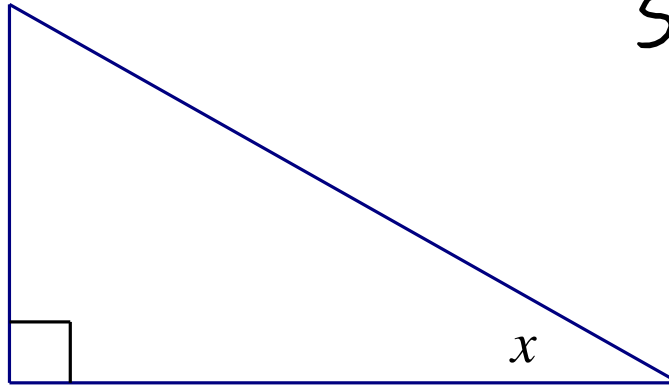
$$x = \frac{9}{\sin 41} = 13.7$$



Ex. Find  $x$ .

SOH CAH TOA  
↑

opp 2



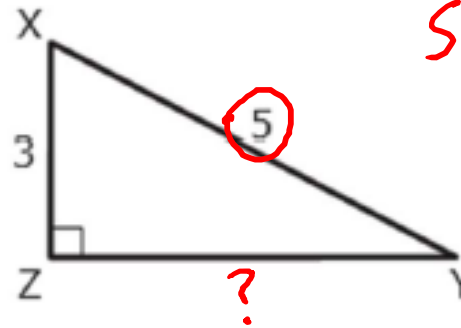
17  
adj.

$$\tan x = \frac{2}{17}$$

$$x = 6.7$$

$$5 \cdot \cos Y = \frac{?}{5} \cdot 5$$

$$5 \cos Y = ?$$



SOH CAH TOA  
↑

Decide whether each expression can be used to find the length of  $\overline{ZY}$ . Mark Yes or No for each expression.

expression	Yes	No
$5 \cos(Y)$	✓	
$3 \cos(Y)$		✓