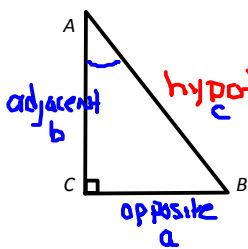# Sine, Cosine and Tangent

Used to find a missing side of a right triangle when one side and one acute angle are given.
Used to find a missing acute angle when two sides are given.

<u>Trigonometry Definitions</u>

$$\sin \angle = \frac{opposite}{hypotenuse}$$

$$\cos \angle = \frac{adjacent}{hypotenuse}$$

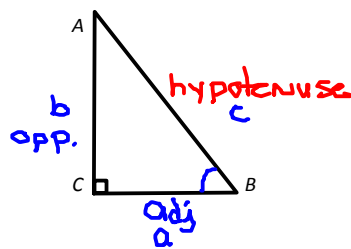$$\tan \angle = \frac{opposite}{adjacent}$$

adjacent b   hypotenuse c

opposite a

$$\sin A = \frac{a}{c}$$

$$\cos A = \frac{b}{c}$$

$$\tan A = \frac{a}{b}$$

b OPP.   hypotenuse c

adj a

$$\sin B = \frac{b}{c}$$

$$\cos B = \frac{a}{c}$$

$$\tan B = \frac{b}{a}$$

1. Approximate each value. Round your answer to four decimal places.

a) $\tan 24° = .4452$

b) $\sin 16° = .2756$

c) $\cos 31° = .8572$

d) $\tan 45° = 1.0000$

e) $\cos 60° = .5000$

f) $\sin 36° = .5878$

2. Approximate each angle. Round your answer to the nearest degree.

a) $\cos x = .5299$ $\cos^{-1} = 58°$

b) $\sin x = .5$ $30°$

c) $\tan x = .5781$ $30°$
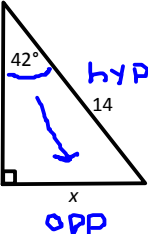
d) $\sin x = .7071$ $45°$

e) $\tan x = .0175$ $1°$

f) $\cos x = .8660$ $30°$

3. Find the value of *x* and round your answer to the nearest tenth.

a)

42° hyp
14
x
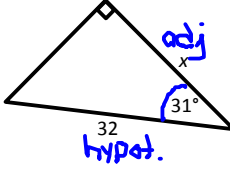OPP

$SIN \angle x = \frac{OPP}{hyp}$

$SIN 42 = \frac{x}{14}$

$x = 14 \cdot SIN 42$

$\boxed{x = 9.4}$

b)

adj
x
31°
32 hypot.

$cos \angle x = \frac{adj}{hyp}$

$cos 31 = \frac{x}{32}$

$x = 32 \cdot cos 31$

$\boxed{x = 27.4}$

c)

30°
x adj
8
OPP

$tan \angle x = \frac{OPP}{adj}$
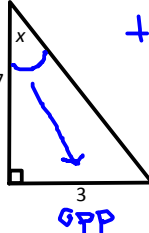
$tan 30° = \frac{8}{x}$

$\frac{x \cdot tan 30}{tan 30} = \frac{8}{tan 30}$
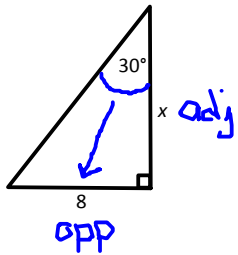
$x = \frac{8}{tan 30}$

$\boxed{x = 13.9}$

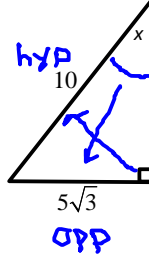4. Find the value of *x*. Round your answer to the nearest degree.

a)

x
adj 7
3
OPP

$tan \angle x = \frac{OPP}{adj}$

$tan x = \frac{3}{7}$

$\boxed{x = 23°}$

b)

hyp
10
x
5√3
OPP

$SIN \angle x = \frac{OPP}{hyp}$

$SIN x = \frac{5\sqrt{3}}{10}$

$\boxed{x = 60°}$

c)

hyp $5\sqrt{2}$

x

5

adj

$\cos x = \dfrac{adj}{hyp}$

$\cos x = \dfrac{5}{(5\sqrt{2})}$

$\boxed{x = 45°}$