

Using SOH-CAH-TOA, answer the following.

1) What does the SOH represent?

$$\text{Sine} = \frac{\text{opposite}}{\text{hypotenuse}}$$

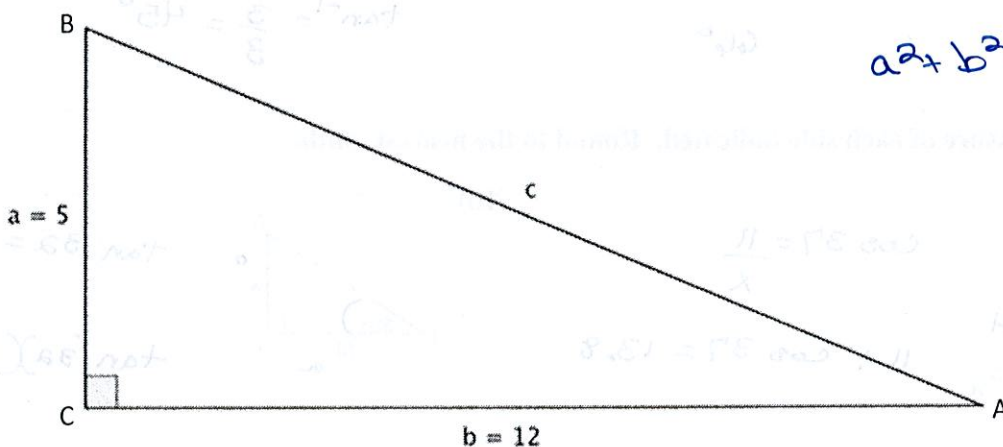
2) What does the CAH represent?

$$\text{cosine} = \frac{\text{adjacent}}{\text{hypotenuse}}$$

3) What does the TOA represent?

$$\text{tangent} = \frac{\text{opposite}}{\text{adjacent}}$$

Use the picture below for problems 4-6.



4) Find the length of the missing side of the triangle above.

$$\begin{aligned} a^2 + b^2 &= c^2 \\ 5^2 + 12^2 &= c^2 \\ 25 + 144 &= c^2 \end{aligned}$$

$$\begin{aligned} 169 &= c^2 \\ \sqrt{169} &= c \\ 13 &= c \end{aligned}$$

5) Set up the appropriate trigonometric ratios. (Don't forget to label the pieces)

a) $\sin(A) = \frac{5}{13}$

d) $\sin B = \frac{12}{13}$

b) $\cos(A) = \frac{12}{13}$

e) $\cos B = \frac{5}{13}$

c) $\tan(A) = \frac{5}{12}$

f) $\tan B = \frac{12}{5}$

6) Solve for the unknown angles.

a) $\angle A = 22.6 = 23^\circ$

b) $\angle B = 67.38 = 67^\circ$

Solve for the missing angle round the nearest tenth.

7)

$\cos^{-1} = \frac{4.4}{11} = 66.4$
 66°

8)

$\tan^{-1} = \frac{3}{3} = 45^\circ$

Find the measure of each side indicated. Round to the nearest tenth.

9)

$\cos 37 = \frac{11}{x}$
 $11 \div \cos 37 = 13.8$

10)

$\tan 32 = \frac{x}{13}$
 $\tan(32)(13) = 8.1$

11)

$\tan 50.1 = \frac{x}{5}$
 $\tan(50.1)(5) = x$
 $x = 5.97 = 6.0$

12)

$\cos 60 = \frac{x}{11}$
 $x = 5.5$

Solve for a and x.

13)

$\tan 41 = \frac{a}{15}$
 $\tan 41(15) = 13.03$
 $a = 13.03$

$\tan^{-1}(x) = \frac{13.03}{10}$
 $x = 52.5 = 53^\circ$

Solve for the missing variable round to the nearest tenth:

14) $\sin(50^\circ) = x$ $.77$

18) $\sin(x) = \frac{2}{5}$ 23.6

15) $\tan(45^\circ) = x$ 1

19) $\frac{3 \cos(x)}{3} = \frac{2}{3}$
 $\cos(x) = \frac{2}{3}$ 48°

16) $\cos(120^\circ) = x$ $-.5$

20) $12 \sin(x) + 8 = 18$
 $\frac{12 \sin(x)}{12} = \frac{10}{12}$ $56.4 = 56^\circ$

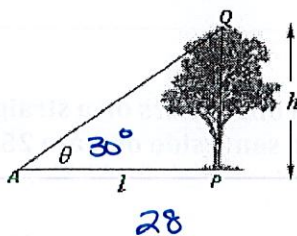
17) $\tan(x) = 1.5$ 56.3

21) $5 \tan(x) - 6 = 4$
 $\frac{5 \tan(x)}{5} = \frac{10}{5}$ $63.4 = 63^\circ$
 $\tan(x) = \frac{10}{5}$

Solve the following problems (Hint draw a picture)

22)

The angle of elevation of the top of a tree is 30° from a point 28 ft away from the foot of the tree. Find the height of the tree rounded to the nearest feet.

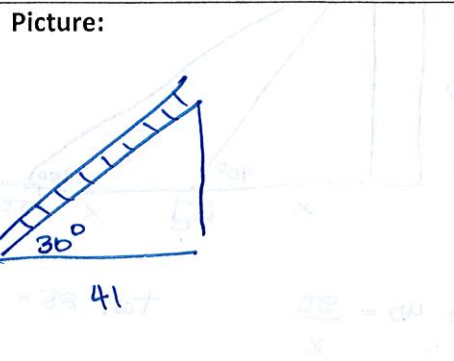


$\tan 30 = \frac{x}{28}$

$x = 16.17$

$x = 16 \text{ ft}$

23) A ladder with its foot on a horizontal flat surface rests against a wall. It makes an angle of 30° with the horizontal. The foot of the ladder is 41 ft from the base of the wall. Find the height of the point where the ladder touches the wall.



$\tan 30 = \frac{x}{41}$

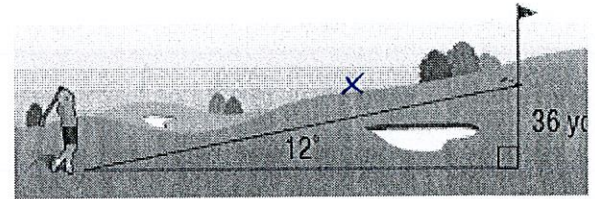
$x = 23.7 \text{ ft}$

- 24) A golfer is standing at the tee, looking up to the green on a hill. If the tee is 36 yards lower than the green and the angle of elevation from the tee to the hole is 12° , find the distance from the tee to the hole.

$$\sin 12 = \frac{36}{x}$$

$$36 \div \sin 12 = x$$

$$173.15 \text{ yds} = x$$

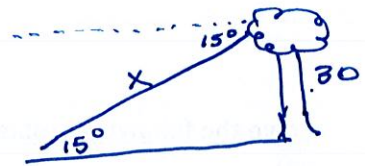


- 25) A tree stand 30 yards tall is attached to a zip cord. The angle of depression between the zip line and a platform on the ground is 15° , find the distance you would travel on this zip line

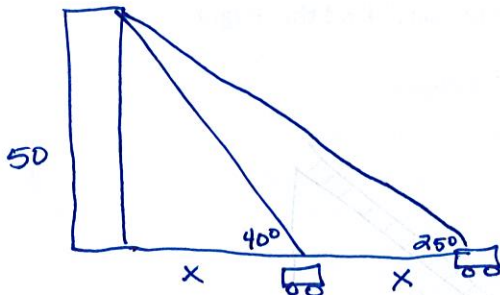
$$\sin 15 = \frac{30}{x}$$

$$x = 115.9 \text{ yds}$$

Picture:



- 26) From the top of a tower of height 50 ft, the angles of depression of two cars on a straight road at the same level as that of the base of the spire and on the same side of it are 25° and 40° . Calculate the distance between the two cars.



Picture:

$$\tan 40 = \frac{50}{x}$$

$$x = 59.59$$

$$\tan 25 = \frac{50}{x}$$

$$x = 107.2$$

$$\begin{array}{r} 107.2 \\ - 59.59 \\ \hline \end{array}$$

$$47.6 \text{ ft}$$