Warm Up:

<u>Ex. 1</u> Find the length of BC to the nearest tenth or a metre.

Have: $Hyp = 12.2$
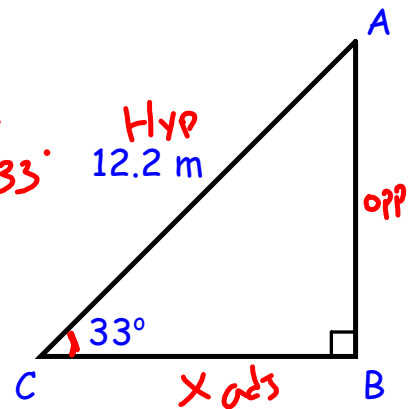angle $33°$

Need: adj

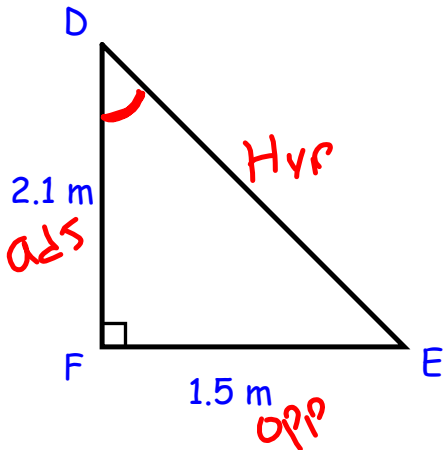Use: $\cos\theta = \dfrac{A}{H}$

Solution: $\cos 33° = \dfrac{x}{12.2}$

$x = 12.2\cos 33°$

$x = 10.2\ m$

A

Hyp
12.2 m

opp

33°

C   x adj   B

<u>Ex. 2</u> Find the measure of angle D, to the nearest degree.

D

2.1 m
adj

Hyp

F
1.5 m   E
opp

Have: $opp = 1.5$
$adj = 2.1$

Need: angle D

Use: $\tan\theta = \dfrac{O}{A}$
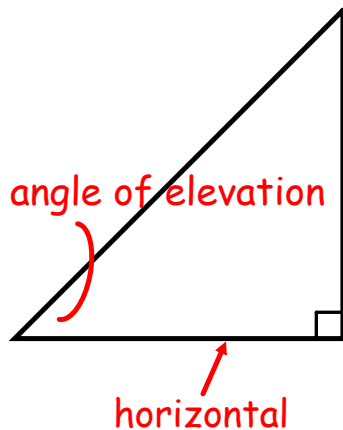
Solution:

$\tan D = \dfrac{1.5}{2.1}$

$\tan D = 0.7143$

$D = \tan^{-1} 0.7143$

$D = 35.5$

$D = 36°$

To talk about angles we need to have a reference point. Sometimes we use an __angle of elevation__ .

The angle of elevation is the angle of view __from the horizontal up to the object being viewed.__

angle of elevation

horizontal

Ex. 3 You are standing 11.2 m from the wall of the school. The angle of elevation from where you are standing to the top of the school is $37°$. Find the height of the school.

Hyp   OPP
X
$37°$
11.2 m
adj

wall of School
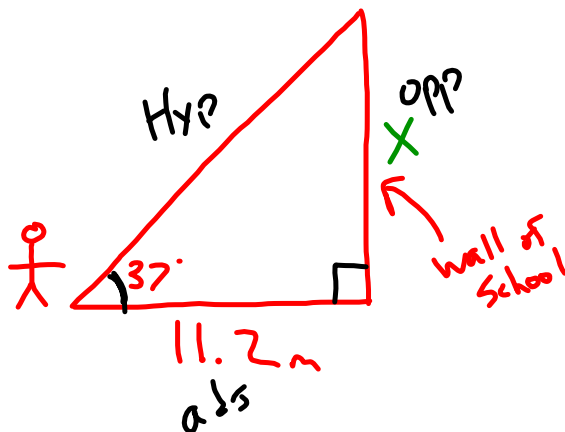
Have: angle $37°$
        adj = 11.2

Need: OPP

use: $\text{Tan } \theta = \frac{O}{A}$

$\dfrac{\text{Tan } 37°}{1} = \dfrac{X}{11.2}$

$X = 11.2 \text{ Tan } 37°$

$x = 8.4$

∴ the height of the school is 8.4 m

Ex. 4 A truck travels 6 km up a mountain road. The change in height is 0.375 km. What is the measure of the angle of elevation?

6 km Hyp

opp
0.375 km

x

adj
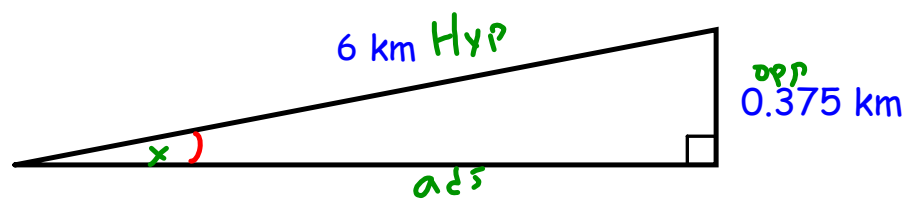
Have : Hyp 6

Opp 0.375

Need : angle x

Use : $\sin \theta = \dfrac{O}{H}$

$\sin x = \dfrac{0.375}{6}$

$\sin x = .0625$
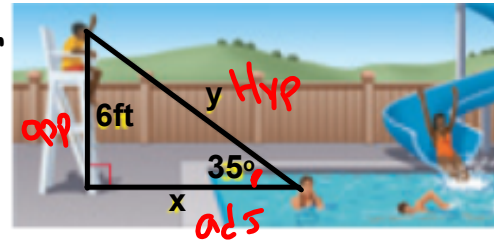
$x = \sin^{-1} 0.0625$

$x = 3.5$

∴ the angle of elevation
is 4°

Ex. 5

The angle of elevation from the swimmer to the lifeguard is 35 and the lifeguard sits 6 ft off the ground .

a) Find the distance x from the swimmer to the base of the lifeguard chair.

Have : angle 35°
      Opp = 6
Need : adj

Use : $\tan\theta = \dfrac{O}{A}$

$$\frac{\tan 35°}{1} = \frac{6}{x}$$

$$\frac{x \, \cancel{\tan 35°}}{\cancel{\tan 35°}} = \frac{6}{\tan 35°}$$

$$x = 8.6 \text{ ft}$$

b) Find the distance y from the swimmer to the lifeguard.

Have : angle 35°
      Opp = 6
Need : Hyp

Use : $\sin\theta = \dfrac{O}{H}$

$$\frac{\sin 35°}{1} = \frac{6}{y}$$

$$\frac{y \sin 35}{\sin 35} = \frac{6}{\sin 35}$$

$$y = \frac{6}{\sin 35}$$

$$y = \frac{6}{0.5735}$$

$$y = 10.5 \text{ ft}$$