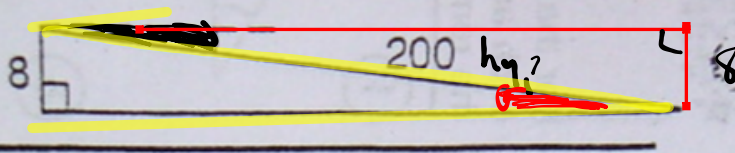


(T) A train decreases its altitude by 8 m when traveling along 200 m of track. Find the angle of depression of the track.



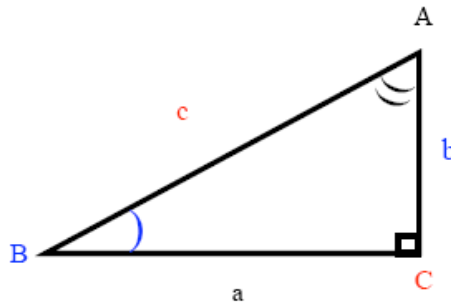
$$\sin \theta = \frac{8}{200}$$

$$\theta = 2^\circ$$

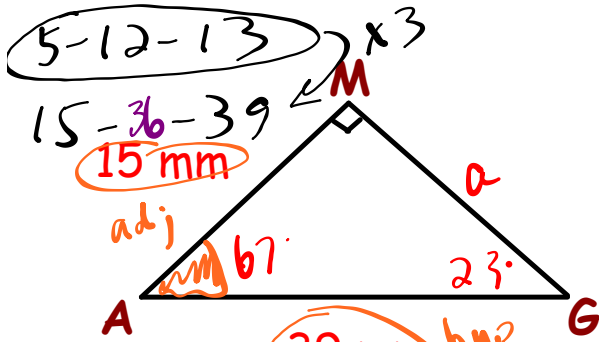
opp

Solving Right Triangles

To solve a right triangle means to determine the measure of all six parts (3 lengths, and 3 angles by using basic trigonometric functions and/or Pythagorean Theorem)



EXAMPLE - Solve the triangle (find ALL sides and angles)



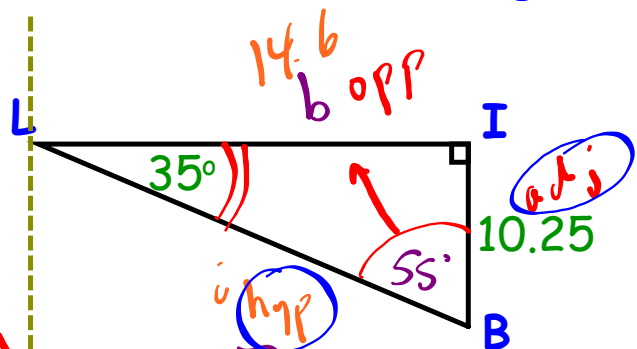
$$\sqrt{a^2} = \sqrt{39^2 - 15^2}$$

$$a = 36$$

$$\cos A = \frac{15}{39}$$

$$\angle A = 67^\circ$$

$$\angle G = 23^\circ$$



$$\angle B = 55^\circ$$

$$\tan 55^\circ = \frac{b}{10.25}$$

$$14.6 = b$$

$$\cos 55^\circ = \frac{10.25}{i}$$

$$i = \frac{10.25}{\cos 55^\circ}$$

$$i = 17.9$$

Example 1 Solving a Right Triangle Given Two Sides

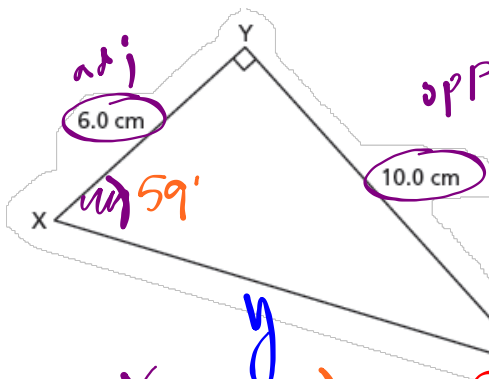
Solve $\triangle XYZ$.
Give the measures to the nearest tenth.



SOLUTION
(erase to reveal)

$$\sqrt{y^2} = \sqrt{10^2 + 6^2}$$

$$y = 11.7 \text{ cm}$$



$$\tan^{-1} \left(\frac{10}{6} \right)$$

$$\angle X = 59^\circ$$

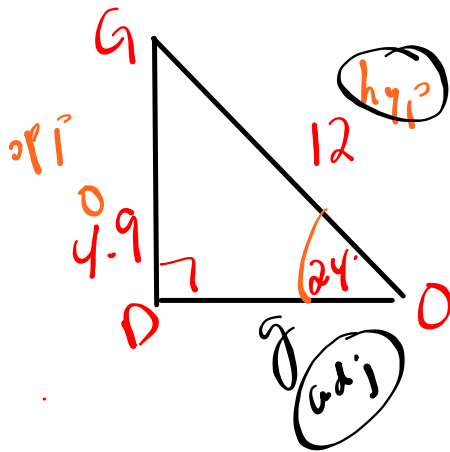
$$\angle Z = 31^\circ$$



CHECK YOUR UNDERSTANDING

YOUR TURN...

Solve $\triangle DOG$, given that angle $D = 90^\circ$, angle $O = 24^\circ$ and $d = 12$.



$$\angle G = 66^\circ$$

$$12 \sin 24^\circ = \frac{4.9}{12} (12)$$

$$4.9 = 0$$

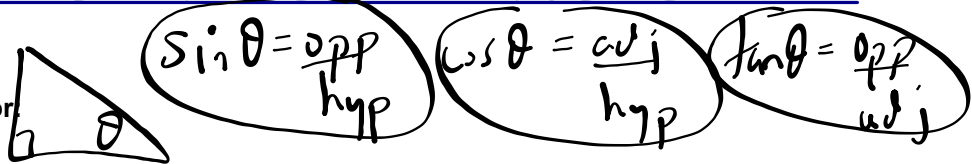
$$12 \cos 24^\circ = \frac{11.0}{12} (12)$$

$$11.0 = 11$$

ANGLES OF ELEVATION/DEPRESSION

Review:

SOH CAH TOA stands for

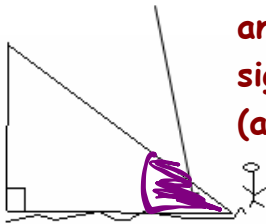


These trig ratios will only work with Right triangles.

In each ratio we have 1 angle(s) and 2 side(s).

Angle of elevation - is the angle

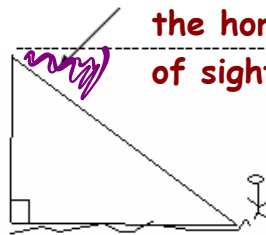
between the ground and the line of sight.
(angle of inclination)



Always from the GROUND up

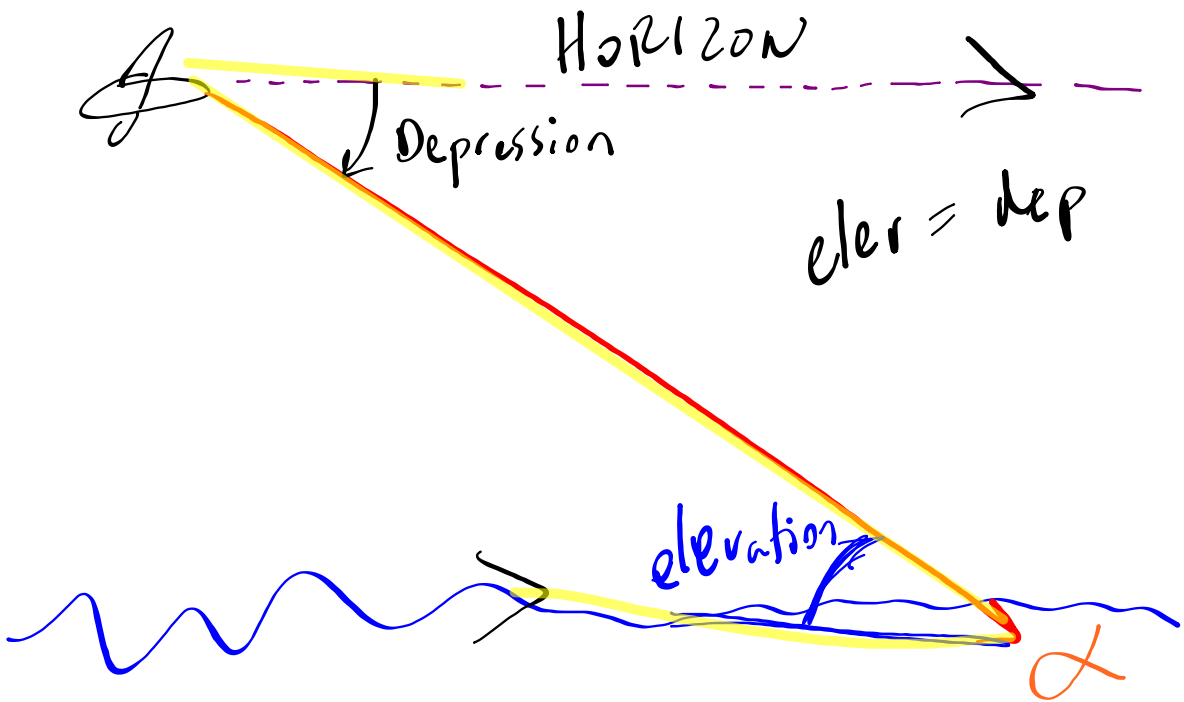
Angle of Depression is the angle between

the horizon and the line of sight.



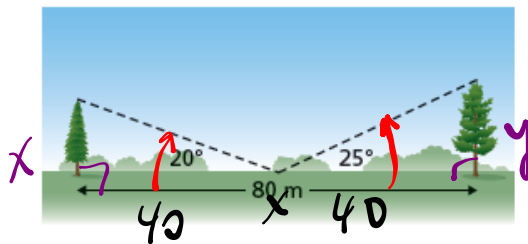
Always outside the triangle

Also, note that the angle of elevation = angle of depression *



EXAMPLE #1:

6. Two trees are 80 m apart. From a point halfway between the trees, the angles of elevation of the tops of the trees are measured. What is the height of each tree to the nearest metre?



$$40 \tan 20^\circ = \frac{x}{40}$$

$$14.6 \text{ m} = x$$

$$40 \tan 25^\circ = \frac{x}{40}$$

$$18.1 \text{ m} = x$$



EXAMPLE 2: Using Sine or Cosine to Solve a Problem

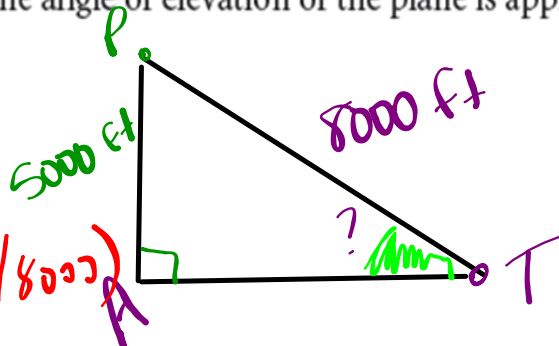
A water bomber is flying at an altitude of 5000 ft. The plane's radar shows that it is 8000 ft. from the target site. What is the angle of elevation of the plane measured from the target site, to the nearest degree?

SOLUTION The angle of elevation of the plane is approximately 39°.
 (erase to reveal)

$$\sin T = \frac{5000}{8000}$$

$$T = \sin^{-1} \left(\frac{5000}{8000} \right)$$

$$T = 39^\circ$$



CHECK YOUR UNDERSTANDING

Hw :

1 ace

2 ace

3 ace

4-6, # 8, # 9

* Need Pictures

Worksheet - Solving and Applications.pdf

Attachments

Worksheet - Solving and Applications.pdf