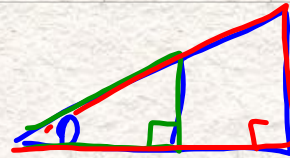


Trigonometry

Feb. 24, 2020

Trigonometry is simply the study of the relationship between the sides and angles of a triangle.

Prior Study of Trig



Recall your previous study of right angled triangles!

- Pythagorean Theorem: $c^2 = a^2 + b^2$
- Trig Ratios

Trigonometric Ratios Feb. 24, 2020

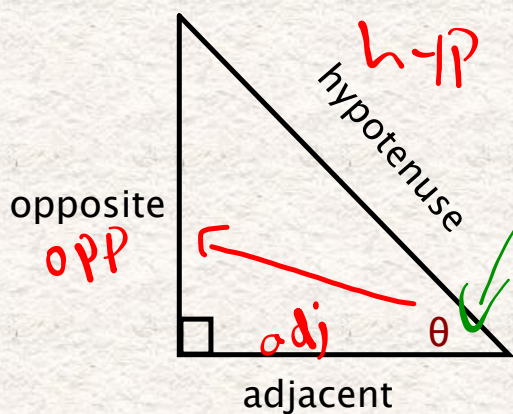
Dec. 14, 2015 Nov. 26, 2012

There are 3 basic trigonometric ratios:

$$\sin \theta = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\cos \theta = \frac{\text{adjacent}}{\text{hypotenuse}}$$

$$\tan \theta = \frac{\text{opposite}}{\text{adjacent}}$$



(60 2 1 2 2 2)
theta
SOH CAH TOA

FM 11

Chapter 3 – Prerequisite Skills

Cross Multiplying – Remember to isolate the variable

Examples

$$\frac{2}{x} = \frac{7}{4}$$

$$7x = 8$$

$$x = 8/7$$

$$\frac{5}{3} = \frac{p}{9}$$

$$3p = 45$$

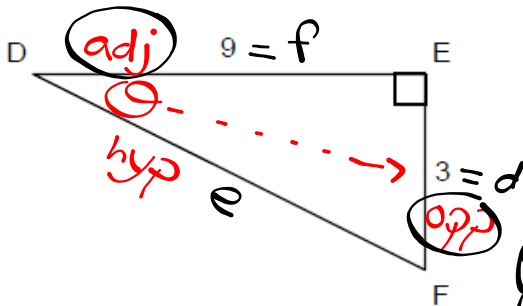
$$p = 15$$

$$\frac{1.5}{6} = \frac{1}{t}$$

$$1.5t = 6$$

$$t = 4$$

1. Determine the measure of $\angle D$ to the nearest tenth of a degree.



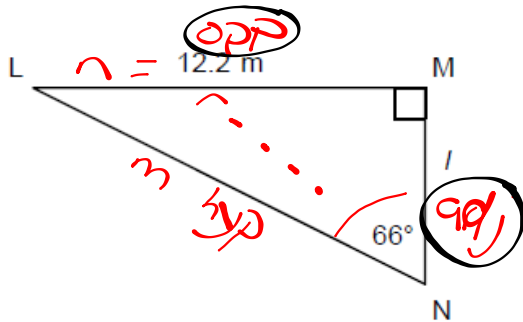
SOH CAH TOA

$$\tan \theta = \frac{3}{9}$$

$$\theta = \tan^{-1}\left(\frac{1}{3}\right)$$

$$\theta = 18.4^\circ$$

2. Determine the length of side l to the nearest tenth of a metre.



SOH CAH TOA

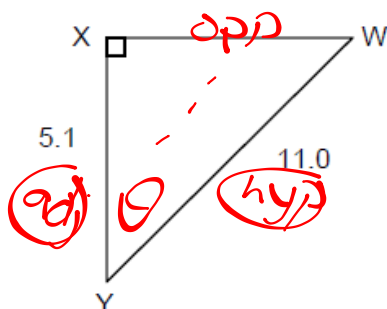
$$\tan 66^\circ = \frac{12.2}{l}$$

$$l \cdot \tan 66^\circ = 12.2$$

$$\frac{l \cdot \tan 66^\circ}{\tan 66^\circ} = \frac{12.2}{\tan 66^\circ}$$

$$l = 5.4 \text{ m}$$

3. Determine the measure of $\angle Y$ to the nearest tenth of a degree.



$$\cos \theta = \frac{5.1}{11}$$

$$\theta = \cos^{-1}\left(\frac{5.1}{11}\right)$$

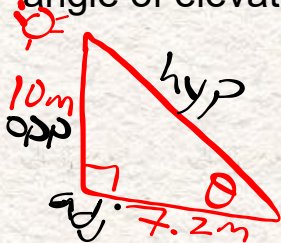
$$\theta = 62.4^\circ$$

$$\angle Y = 62.4^\circ$$

Trigonometry Word Problems

1. A flagpole (10 m tall) casts a shadow 7.2m long. Calculate the angle of elevation of the sun.

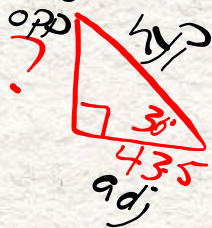
$$\theta = 54^\circ$$



$$\tan \theta = \frac{10}{7.2}$$

$$\theta = \tan^{-1}\left(\frac{10}{7.2}\right)$$

2. A monument casts a shadow that is 43.5 m. The rays of the sun strike the ground at an angle of 36° . Calculate the height of the monument.



$$\tan 36^\circ = \frac{?}{43.5}$$

$$\text{height} = 31.6 \text{ m}$$