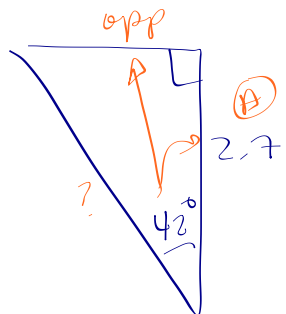


9 a)



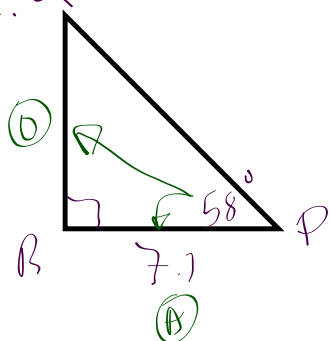
$$\tan 42 = \frac{\text{opp}}{2.7}$$

$$2.7 \tan 42 = \text{opp.}$$

$$2.43 = \text{opp}$$

→ Now Pythagoras

12. Q



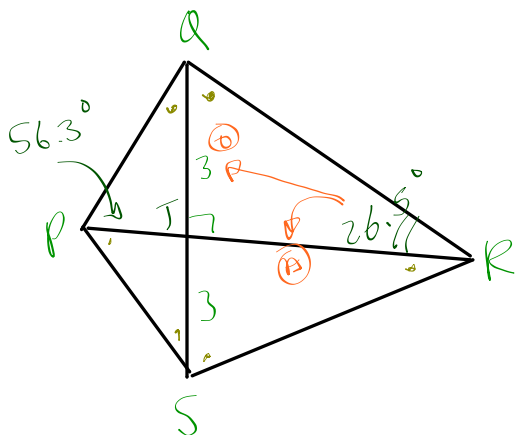
$$A = \frac{bh}{2}$$

$$A = \frac{(7.1)(11.36)}{2}$$

$$\tan 58 = \frac{QR}{7.1}$$

$$QR = 11.36$$

∠ QRT

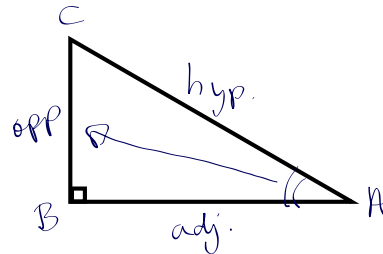


2.4 Sine and Cosine

If $\angle A$ is an acute angle in a right triangle, then:

$$\sin \angle A = \frac{\text{length of the opposite side}}{\text{length of the hypotenuse}}$$

$$\cos \angle A = \frac{\text{length of the adjacent side}}{\text{length of the hypotenuse}}$$



remember: SOH

CAH

TOA

$$\text{Sin} = \frac{\text{Opp}}{\text{Hyp}}$$

$$\text{Cos} = \frac{\text{Adj}}{\text{Hyp}}$$

$$\text{Tan} = \frac{\text{Opp}}{\text{Adj}}$$

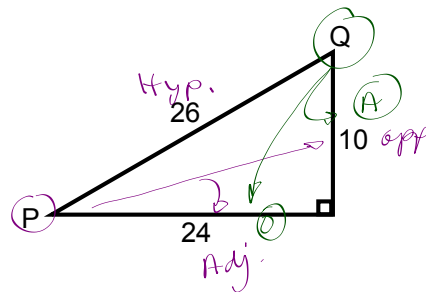
ex. Determine the cos and sin of $\angle P$ and $\angle Q$

$$\cos \angle P = \frac{24}{26}$$

$$\cos \angle Q = \frac{10}{26}$$

$$\sin \angle P = \frac{10}{26}$$

$$\sin \angle Q = \frac{24}{26}$$



ex. Determine the measure of $\angle P$ and $\angle Q$ to the nearest degree.

$$\angle P = \cos^{-1}\left(\frac{24}{26}\right)$$

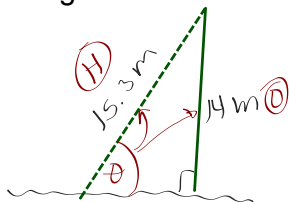
$$\angle Q = \cos^{-1}\left(\frac{10}{26}\right) \Rightarrow \angle Q = 67.4^\circ$$

$$\angle P = \sin^{-1}\left(\frac{10}{26}\right)$$

$$\angle Q = \sin^{-1}\left(\frac{24}{26}\right) \Rightarrow \angle Q = 67.4^\circ$$

$$\angle P = 22.6^\circ$$

ex. Drunken trees are a result of melting permafrost in the far north. Find the angle of a tree if it was originally 15.3 m tall but now stands only 14 m high.



$$\sin \theta = \frac{O}{H}$$

$$\left(\sin \theta = \frac{14}{15.3}\right) \sin^{-1}$$

$$\theta = \sin^{-1}\left(\frac{14}{15.3}\right)$$

$$\theta = 66.21^\circ$$

∴ The tree makes an angle 66.2° with the ground

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variables to represent angles

$\theta = \text{theta}$
 $\phi = \text{phi}$

2.5 Determining Lengths with Sine and Cosine

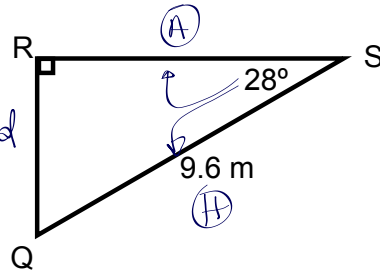
ex. Determine the length of \overline{RS} to the nearest tenth of a meter.

* find the trig ratio that uses (H) and (A)

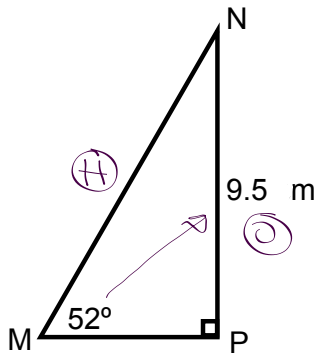
↳ CAH \Rightarrow COS

$$\cos 28^\circ = \frac{RS}{9.6}$$

$$9.6 \cos 28^\circ = RS \Rightarrow RS = 8.5 \text{ m}$$



ex. Determine the length of \overline{MN} to the nearest tenth of a meter.



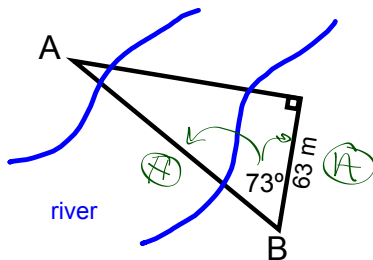
$$\text{SOH} \Rightarrow \sin = \frac{O}{H}$$

$$\sin 52^\circ = \frac{9.5}{MN}$$

$$MN = \frac{9.5}{\sin 52^\circ}$$

$$MN = 12.1 \text{ m}$$

ex. What is the distance between tower A and tower B to the nearest meter?



SOH (CAH) TO A

$$\cos 73^\circ = \frac{63}{AB}$$

$$AB = \frac{63}{\cos 73^\circ}$$

$$AB = 219 \text{ m}$$