

Trigonometry: Sine Ratio (Sides & Angles)

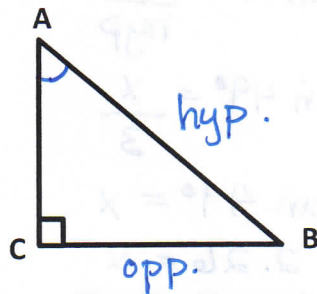
Date: Notes

REMEMBER

SOH - CAH - TOA

In a right triangle, the sine ratio of each non-right angle is given by (Remember SOH!):

$$\sin A = \frac{\text{opposite}}{\text{hypotenuse}} = \frac{O}{H}$$



Example #1:

Use your calculator to find each value to four decimal places.

a) $\sin 42^\circ = 0.6691$

b) $\sin 33^\circ = 0.5446$

Example #2:

Use your calculator to find the measure of each angle A to the nearest degree.

(Hint: Use \sin^{-1})

a) $\sin A = 0.6092$

$$\angle A = \sin^{-1}(0.6092)$$

$$\angle A = 37.53$$

$$\angle A = \boxed{38^\circ}$$

b) $\sin A = 0.1425$

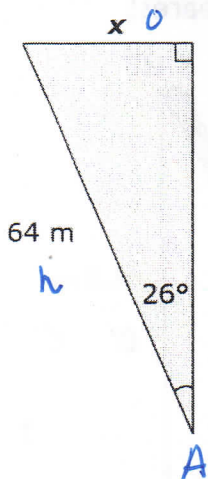
$$\angle A = \sin^{-1}(0.1425)$$

$$\angle A = 8.19$$

$$\angle A = \boxed{8^\circ}$$

Example #3: Finding a Missing Side

Find the measurement of the missing side of the triangle. Round your answer to 1 decimal.



$$\sin A = \frac{\text{opp}}{\text{hyp}}$$

$$\sin 26^\circ = \frac{x}{64}$$

$$64 \sin 26^\circ = x$$

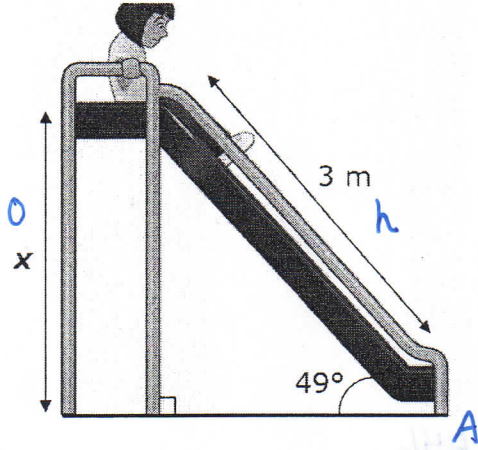
$$\boxed{28.1} = x$$

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Example #6: Finding a Missing Side

A new playground was built and Sarah was afraid to go down the slide. The slide was 3m long and the incline of the slide to the ground was 49° . How high was the slide off the ground to 1 decimal place.



$$\sin A = \frac{\text{OPP}}{\text{hyp}}$$

$$\sin 49^\circ = \frac{x}{3}$$

$$3 \sin 49^\circ = x$$

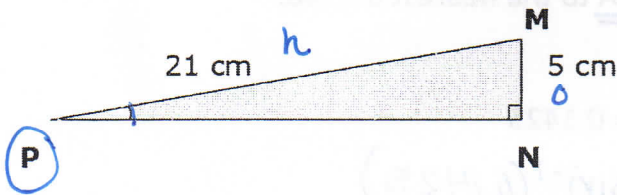
$$2.26 = x$$

$$\boxed{2.3 = x}$$

\therefore slide is 2.3 m high from ground.

Example #4: Finding an Angle \rightarrow use inverse (\sin^{-1}) to find angle.

Find the measure of $\angle P$. Round your answer should be to two decimal places. *to the nearest degree.*



$$\sin P = \frac{\text{OPP}}{\text{hyp}}$$

$$\sin P = \frac{5}{21}$$

$$\angle P = \sin^{-1}\left(\frac{5}{21}\right)$$

$$\angle P = 13.7$$

$$\boxed{\angle P = 14^\circ}$$

Example #5: Finding an Angle

A storm caused a 13.5m hydro pole to lean over. The top of the pole is now 11.8m above the ground. Find the measure of the angle between the pole and the ground, to the nearest degree.

$$\sin P = \frac{\text{OPP}}{\text{hyp}}$$

$$\sin P = \frac{11.8}{13.5}$$

$$\angle P = \sin^{-1}\left(\frac{11.8}{13.5}\right)$$

$$\angle P = 60.93$$

$$\boxed{\angle P = 61^\circ}$$

