

Homework Questions

10.8 #2

#1

#5

SOLT CAH (TOA)

1 To measure the width of a swamp the following measurements are noted on the diagram. What is the width of the swamp?

$$25 \tan 82^\circ = \frac{w}{25}$$

$$77.9 \text{ m} = w$$

2 The slope of a ski hill is 0.84. Find the angle that the hill makes with the horizontal.

SOLT CAH (TOA)

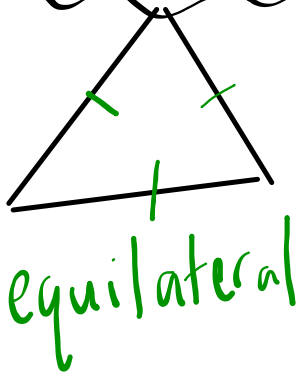
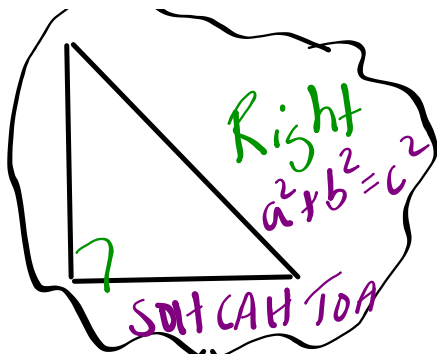
$$\begin{aligned} \text{slope} &= 0.84 \\ \frac{\text{Rise}}{\text{Run}} &= 0.84 \\ \frac{\text{opp}}{\text{adj}} &= 0.84 \\ \tan^{-1} \rightarrow \tan \theta &= (0.84) \\ \theta &= 40^\circ \end{aligned}$$

5 A mountain road is inclined at 17° to the horizontal. If you travel 3 km up the road, by how many metres has your altitude increased?

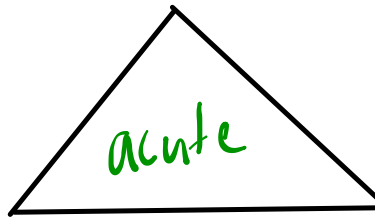
$$3 \sin 17^\circ = \frac{x}{3}$$

$$0.9 \text{ km} = x$$

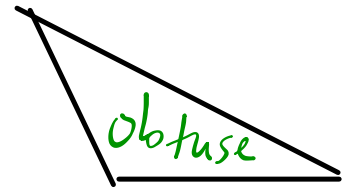
877 m



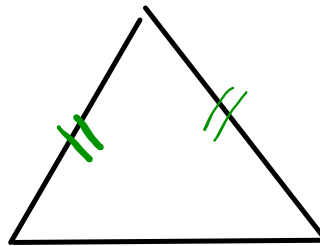
equilateral



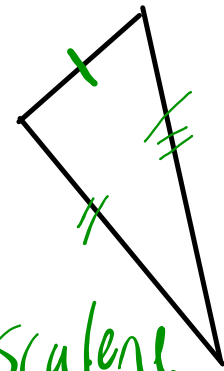
acute



obtuse



isosceles



scalene

Law of Sines

** Used when the triangle does not contain 90 degree (Oblique Triangle)

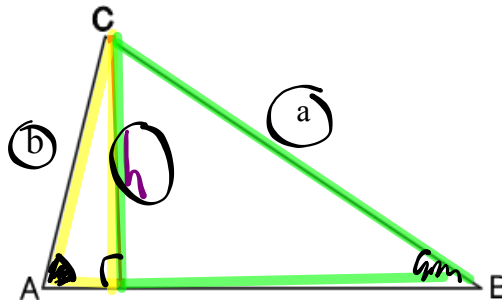
** In order to use you must be given 1) an angle and an opposite side

2) any other side or angle

Lower case letters "a,b,c" represent side lengths

Upper case letters "A,B,C" represent angle measures

Let's derive the Law of Sines...



$$b \sin A = \frac{h}{b} \times b \quad a \sin B = \frac{h}{a} \times a$$

$$\frac{b \sin A}{\sin B \sin A} = \frac{a \sin B}{\sin A \sin B}$$

$$\frac{b}{\sin B} = \frac{a}{\sin A}$$

unknown **Law of Sines** unknown

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

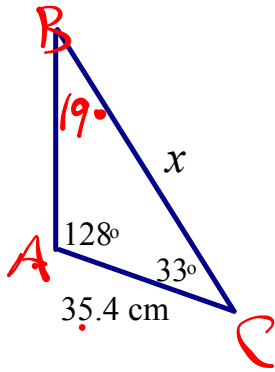
$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$



"when looking for a side"

"when looking for an angle"

EXAMPLE #1 - Finding a side.



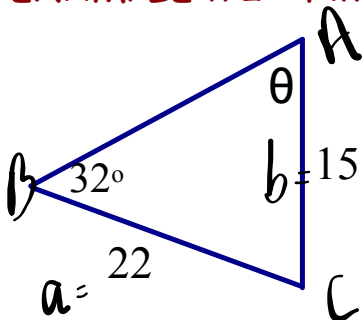
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35.4sin(128)/sin
(19)      85.6827681
35.4/sin(19)*sin
(128)    85.6827681
■
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$$\frac{a}{\sin A} = \frac{b}{\sin B}$$

$$\frac{x}{\sin 128} = \frac{35.4 \sin 128}{\sin 19}$$

$$x = 85.68 \text{ cm}$$

EXAMPLE #2 - Finding an angle.



$$\frac{15 \sin \theta}{15} = \frac{22 \sin 32}{15}$$

$$\sin \theta = \frac{22 \sin 32}{15}$$

$$\frac{\sin \theta}{a} = \frac{\sin B}{b}$$

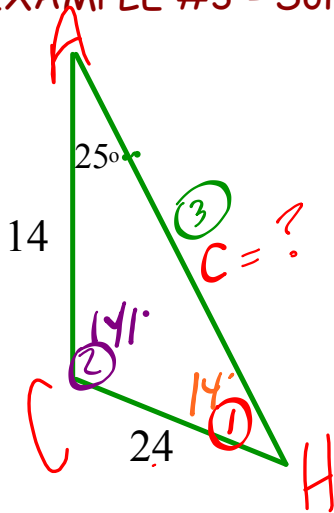
$$\frac{\sin \theta}{22} = \frac{22 \sin 32}{15}$$

$$\sin \theta = \frac{22 \sin 32}{15}$$

$$\sin^{-1} \sin \theta = (0.7772)$$

$$\theta = 51^\circ$$

EXAMPLE #3 - Solve the triangle.



$$\frac{\sin A}{a} = \frac{\sin B}{b}$$

$$\frac{a}{\sin A} = \frac{b}{\sin B}$$

$$\frac{14 \sin H}{14} = \frac{14 \sin 25}{24}$$

$$\sin^{-1} \sin H = (0.2465)$$

$$\angle H = 14^\circ$$

↑
"angle"

$$\angle C = 180 - 25 - 14$$

$$\angle C = 141^\circ$$

$$\frac{c \sin 141}{\sin 141} = \frac{24}{\sin 25}$$

$$c = 35.7$$

EXAMPLE #4 - Application

Suppose that Mr. Watters was playing a straight par-3 golf hole that was 120 m long. He hits one of his regular old slices that ends up 40 ° off line and is still 82 m from the hole.

- (a) How far did his tee shot travel?
- (b) If he somehow miraculously hits his next shot onto the green, what was the angle between the path of his first shot and the path followed by the second shot?

Homework...

Worksheet - Law of Sines.doc

10.9
Left Side...

#1 - 6

~~Right Side...~~

~~#1 - 4~~