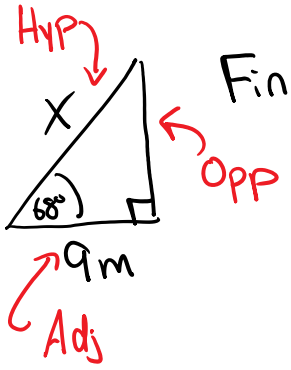
2.5 - Sine & Cosine Lengths

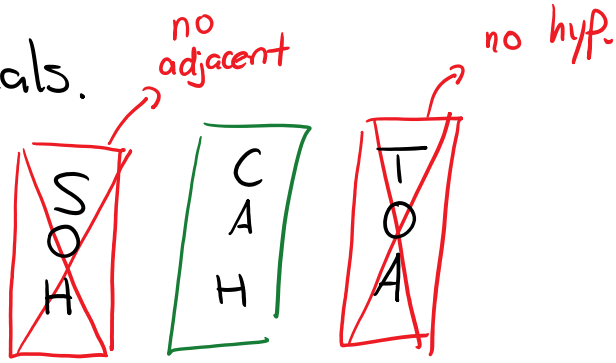
October 23, 2019 12:33 PM

Just like with tangent, we can use sine and cosine to find the length of sides:

Ex: Find x to 2 decimals.



Hyp = x
Adj = 9m
Opp = ?
$\theta = 68°$



↳ has what we know and what we need.

$$\cos\theta = \frac{Adj}{Hyp.}$$

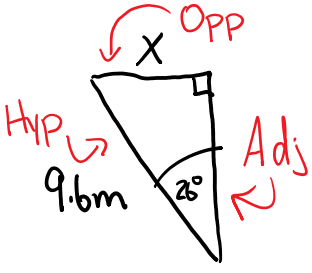
$$x \cdot \cos(68°) = \frac{9m}{x}$$

$$\frac{x\cos(68°)}{\cos(68°)} = \frac{9m}{\cos(68°)}$$

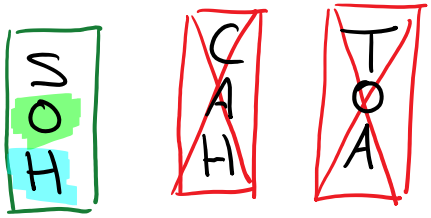
$$x = \frac{9m}{\cos(68°)} = \frac{9m}{0.374606\ldots} \cong 24.02520\ldots m$$

$$x = 24.03m$$

Ex: Find x to the nearest meter:



We have hyp, and we want opp



$$\sin\theta = \frac{OPP}{HYP}$$

$$9.6m \times \sin(26^\circ) = \frac{x}{(9.6m)} \times 9.6m$$

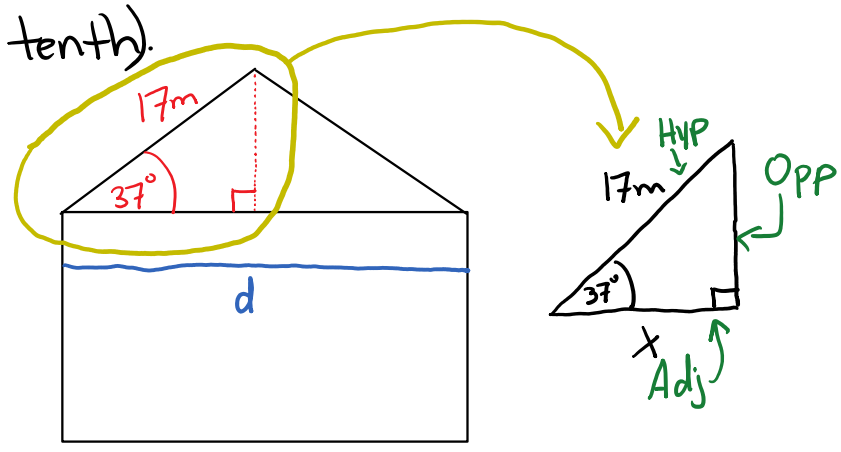
$$(9.6m)(\sin(26^\circ)) = x$$

$$x = 9.6m \times 0.43837....$$

$$x \cong 4.208.... m$$

$$x = 4m$$

Ex: The angle of elevation of a roof is 37°, and the piece of wood used for half the roof is 17m. What is the length of the ceiling from wall to wall? (To the nearest tenth).



We have hyp, we want adj. so....

SOH CAH TOA

$\cos\theta = \frac{Adj}{Hyp}$

$17m \times \cos(37°) = \frac{x}{(17m)} \times \frac{1}{17m}$

$17m \times \cos(37°) = x$

$x \cong 13.5768\ldots m$

$d = 2x$

$d = 2(13.5768\ldots m)$

$d = 27.1536\ldots m$

$d = 27.2m$

HW: Pg. 101 # 3-7, 12