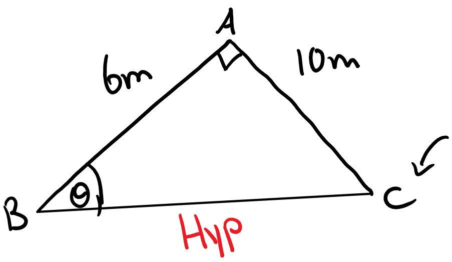
When we determine ALL side lengths and ALL angles in a triangle, we have "SOLVED" the triangle.

3 strategies in particular will be useful:

1. Trig Ratios (SOH CAH TOA)
2. Pythagorean Theorem ($a^2+b^2=c^2$)
3. All angles in a triangle add to 180°

Ex: Solve the following triangle: (nearest unit)



1. $a^2+b^2=c^2$ Hyp

$(6m)^2+(10m)^2=c^2$

$36m^2+100m^2=c^2$

$\sqrt{136m^2}=\sqrt{c^{\cancel{2}}}$

$c=\sqrt{136m^2}=11.661\ldots m$

$c=12m$

2. $\tan B=\frac{OPP}{Adj}$

$\tan^{-1}(\tan B)=\tan^{-1}\left[\frac{(10m)}{(6m)}\right]$

$\cancel{\tan^{-1}(\tan} B)=\tan^{-1}\left[\frac{10m}{6m}\right]$

$B=\tan^{-1}\left[\frac{10m}{6m}\right]=59.036^\circ\ldots$

$B=59^\circ$

3. $A+B+C=180^\circ$

$(90^\circ)+(59^\circ)+C=180^\circ$

$\cancel{149^\circ}+C=180^\circ$

$\cancel{-149^\circ}\qquad -149^\circ$

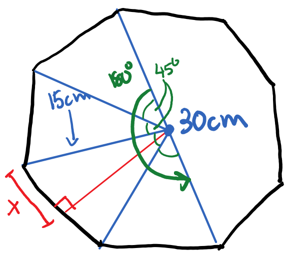
$C=180^\circ-149^\circ=31^\circ$

$C=31^\circ$

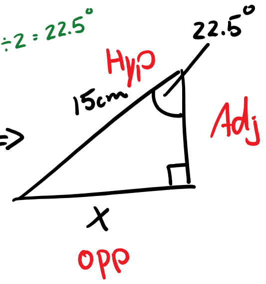
Ex: Mr. Mehrassa bought octagon table and he wants to put a wooden border around the outside of the table. He tells us the table measures 30 cm across the middle, corner to corner. How much wood does he need for the border?

$\frac{180^\circ}{4} = 45^\circ$

$45^\circ \div 2 = 22.5^\circ$



$\Rightarrow$



$\Rightarrow \sin\theta = \frac{Opp}{Hyp.}$

$15 \times \sin 22.5 = \frac{x}{15} \times 15$

$15 \times \sin 22 = x$

$x \doteq 5.7402\ldots$ cm

2 x's make 1 side...

$2(5.7402\ldots \text{ cm}) = 11.4805\ldots \text{ cm}$

8 sides total....

$8(11.4805\ldots \text{ cm}) = 91.8440\ldots \text{ cm}$

$\doteq 92$ cm

HW: Pg. 111 #3-7, 9, 12