Right Triangle Trigonometry
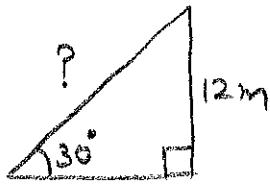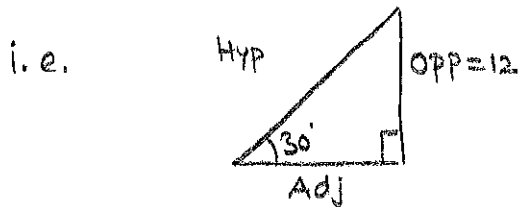
Learing Outcome- Use a trigometric ratio to determine an unknown side or an unknown angle of a right triangle.

Ex.

? 12m
30°

Ex.

15m
?
10m

Sol. Step 1. Label the sides

i.e.

Hyp   OPP=12
30°
Adj

Step 1.

Hyp.=15   Opp
P
Adj=10

Step 2. Choose the correct formula
(Here, you are dealing with 'Hyp' and 'opp', therefore choose the formula which has both of these.)

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

Step 2.

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

Step 3. Plug-in the info.

$$Sin\,30° = \frac{12}{x}$$

Step 3.

$$Cos\,x = \frac{10}{15}$$

Step 4. Do the calculation to isolated 'x' on one side.

i.e.
$$0.5 = \frac{12}{x}$$
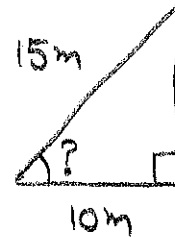
$$\frac{0.5}{1} = \frac{12}{x}$$

$$0.5 \times x = 1 \times 12 \quad \left\{ \begin{array}{c} CROSS \\ Multiplication \end{array} \right\}$$

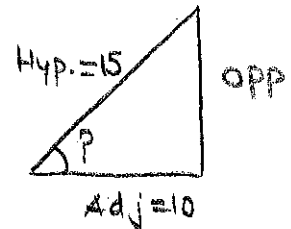$$\frac{0.5 \times x}{0.5} = \frac{12}{0.5}$$

$$\boxed{x = 24}$$

Step 4
$$Cos\,x = 0.667$$

$$Cos^{-1}(Cos\,x) = Cos^{-1}(0.667)$$

$$\boxed{x = 48.19°}$$