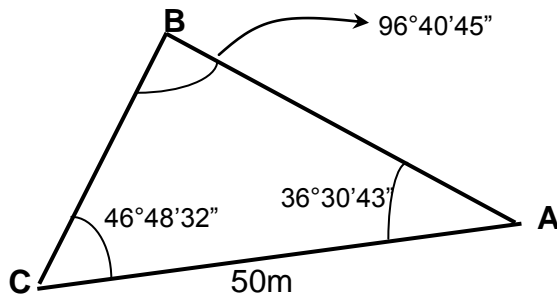


MATHEMATICS ANSWERS

Level Two

Sine and Cosine Rule

1)

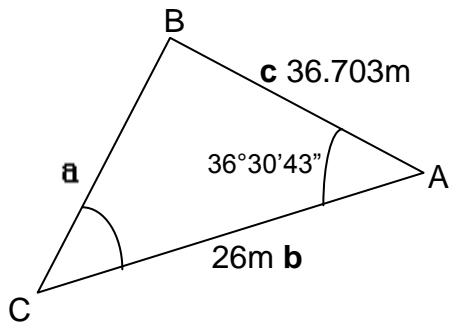


Calculate angle CBA = $96^{\circ}40'45''$

$$\begin{aligned} \text{Sin Rule } \frac{c}{\sin C} &= \frac{b}{\sin B} \\ \frac{c}{\sin 46^{\circ}48'32''} &= \frac{b}{\sin 96^{\circ}40'45''} \\ c &= \frac{50 \times (\sin 46^{\circ}48'32'')}{\sin(96^{\circ}40'45'')} \end{aligned}$$

$$c = 36.703\text{m}$$

2)



$\angle BAC$ is still $36^{\circ}30'43''$

cosine rule $a^2 = b^2 + c^2 - 2bc \cos A$

In this case:

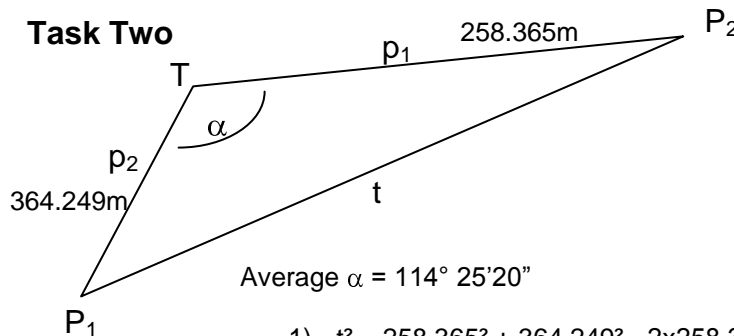
$$\begin{aligned} BC^2 &= (26)^2 + (36.703)^2 - (2 \times 26 \times 36.703 \times \cos(36^{\circ}30'43'')) \\ BC &= 22.12\text{m} \end{aligned}$$

$$\angle BCB \Rightarrow \cos C = \frac{a^2 + b^2 - c^2}{2ab} \Rightarrow \frac{(22.116)^2 + 26^2 - 36.703^2}{2 \times 22.116 \times 26}$$

$$\Rightarrow \cos C = \frac{-181.992753}{1150.048} \Rightarrow \cos C = -0.158250$$

$$\Rightarrow C = 99^{\circ}6'19''$$

Task Two



$$\begin{aligned} 1) \quad t^2 &= 258.365^2 + 364.249^2 - 2 \times 258.365 \times 364.249 \times \cos(114^{\circ}25'20'') \\ t &= 526.545\text{m} \end{aligned}$$

$$\begin{aligned} 2) \quad \frac{\sin P_2}{p_2} &= \frac{\sin \alpha}{t} = \frac{\sin P_1}{p_1} \Rightarrow \sin P_1 = 0.446775 \\ &\Rightarrow \sin P_2 = 0.629874 \Rightarrow P_1 = 26^{\circ}32'13'' \\ &\Rightarrow P_2 = 39^{\circ}2'27'' \end{aligned}$$