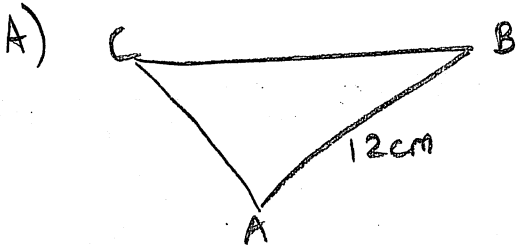


Trigonometry Solutions



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

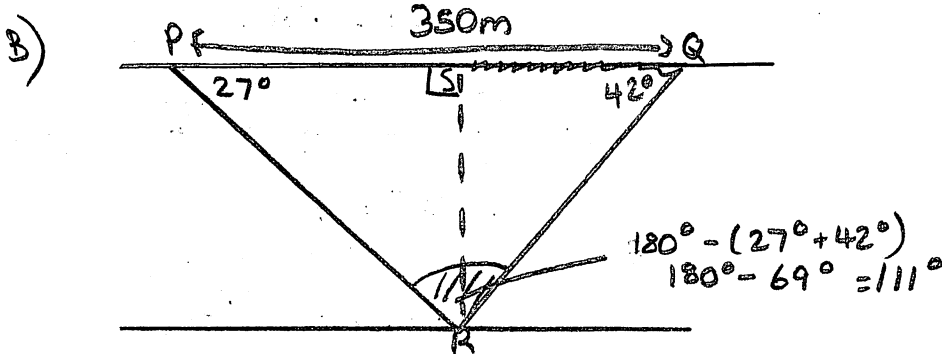
$$\frac{AC}{\sin B} = \frac{12}{\sin C}$$

$$\frac{AC}{\frac{1}{3}} = \frac{12}{\frac{1}{2}}$$

$$\frac{AC}{\frac{1}{3}} = 24$$

$$\times \frac{1}{3} \qquad \qquad \qquad \times \frac{1}{3}$$

$$\underline{AC = 8 \text{ cm}}$$



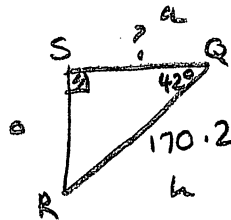
First find QR

$$\frac{QR}{\sin 27^\circ} = \frac{350}{\sin 111^\circ}$$

$$\frac{QR}{\sin 27^\circ} = 374.9$$

$$QR = 374.9 \times \sin 27^\circ$$

$$QR = 170.2 \text{ m}$$

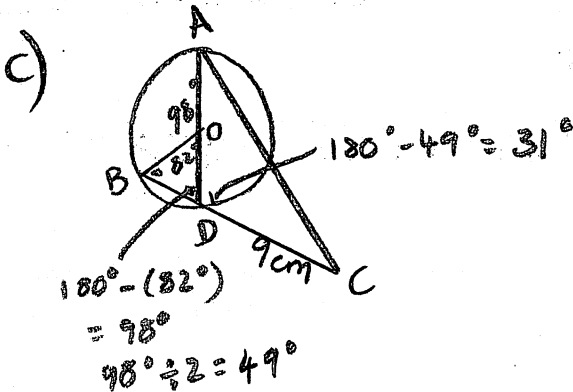


$$\cos 42^\circ = \frac{QS}{170.2}$$

$$\cos 42^\circ = \frac{QS}{170.2}$$

$$QS = 170.2 \times \cos 42^\circ$$

$$\underline{QS = 126.5 \text{ m}}$$



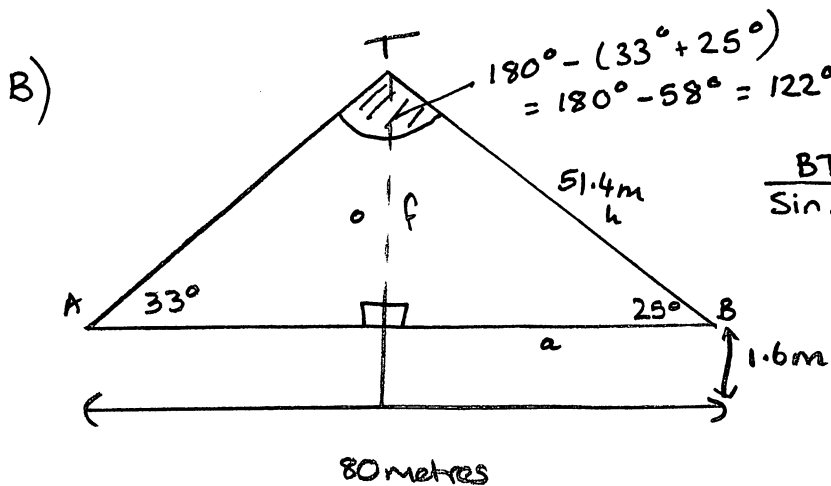
$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$|AC|^2 = 14^2 + 9^2 - 2 \times 14 \times 9 \times \cos 31^\circ$$

$$|AC|^2 = 60.99$$

$$\underline{|AC| = \sqrt{60.99} = 7.8 \text{ cm}}$$

A) Area = $\frac{1}{2}ab \sin C$
 $= \frac{1}{2} \times 100 \times 120 \times \sin 65^\circ$
 $= \underline{5437.85 \text{ m}^2}$

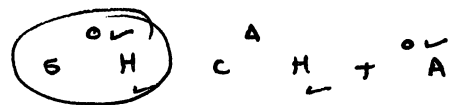


$$\frac{BT}{\sin 33^\circ} = \frac{80}{\sin 122^\circ}$$

$$\frac{BT}{\sin 33^\circ} = 94.33$$

$$BT = 94.33 \times \sin 33^\circ$$

$$BT = 51.4 \text{ m}$$

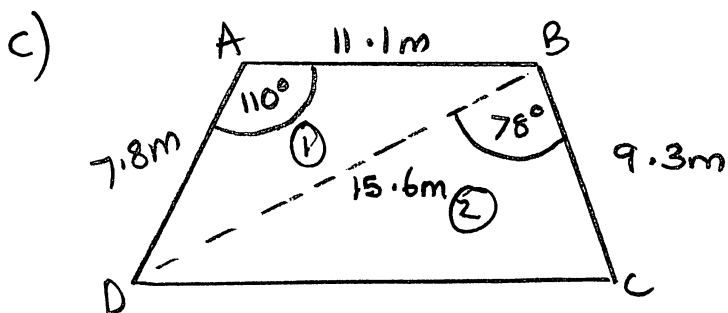


$$\sin 25^\circ = \frac{f}{51.4}$$

$$51.4 \times \sin 25^\circ = f$$

$$f = 21.7 \text{ m}$$

$$\text{Total height} = 21.7 + 1.6 = \underline{23.3 \text{ m}}$$



(a) Diagonal $a^2 = b^2 + c^2 - 2bc \cos A$

$$(BD)^2 = 7.8^2 + 11.1^2 - 2 \times 7.8 \times 11.1 \times \cos 110$$

$$|BD|^2 = 243.27$$

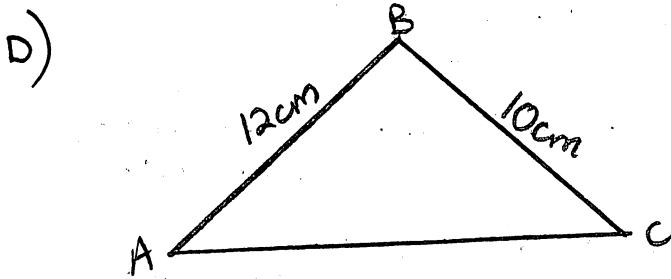
$$|BD| = \sqrt{243.27} = \underline{15.6 \text{ m}}$$

(b) Area of garden = area ① + area ②

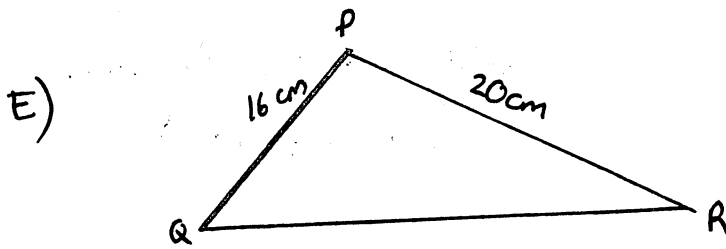
$$(0.5 \times 7.8 \times 11.1 \times \sin 110) + (0.5 \times 15.6 \times 9.3 \times \sin 78)$$

$$= 40.68 + 70.95$$

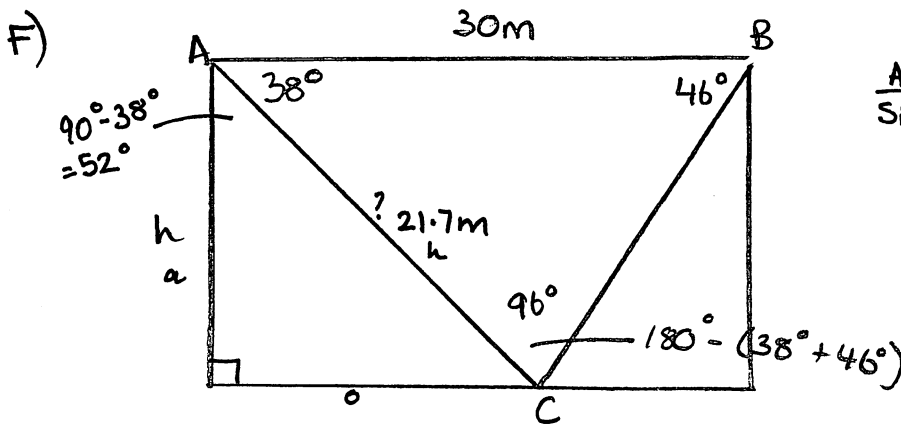
$$= \underline{111.63 \text{ m}^2}$$



$$\begin{aligned} \text{Area} &= \frac{1}{2} ab \sin C \\ &= \frac{1}{2} \times 12 \times 10 \times \frac{2}{3} \\ &= 60 \times \frac{2}{3} = 40 \text{cm}^2 \end{aligned}$$



$$\begin{aligned} \text{Area} &= \frac{1}{2} ab \sin C \\ &= \frac{1}{2} \times 16 \times 20 \times \frac{1}{4} \\ &= 160 \times \frac{1}{4} \\ &= 40 \text{cm}^2 \end{aligned}$$



$$\frac{AC}{\sin 46^\circ} = \frac{30}{\sin 96^\circ}$$

$$\frac{AC}{\sin 46^\circ} = 30.17$$

$$AC = 30.17 \times \sin 46^\circ$$

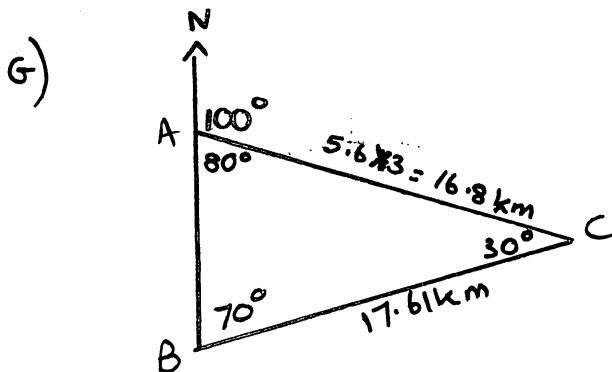
$$AC = 21.7 \text{m}$$

S.O.H (C.A.H) + ° A ✓

$$\cos 52^\circ = \frac{h}{21.7}$$

$$h = 21.7 \times \cos 52^\circ$$

$$h = 13.36 \text{m}$$



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

$$\frac{BC}{\sin 80^\circ} = \frac{16.8}{\sin 70^\circ}$$

$$\frac{BC}{\sin 80^\circ} = 17.88$$

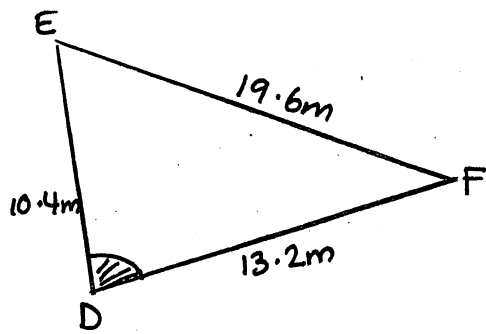
$$BC = 17.88 \times \sin 80^\circ$$

$$BC = 17.6 \text{km}$$

Bob's speed is $17.61 \div 3 = 5.87 \text{kmph}$

Bob is faster by 0.27kmph

H)



$$\cos A = \frac{b^2 + c^2 - a^2}{2bc}$$

$$\cos \hat{EDF} = \frac{13.2^2 + 10.4^2 - 19.6^2}{2 \times 13.2 \times 10.4}$$

$$\cos \hat{EDF} = \frac{-101.76}{274.56} = -0.37\dots$$

$$\hat{EDF} = \cos^{-1}(-0.37\dots)$$

$$\hat{EDF} = \underline{111.8^\circ}$$