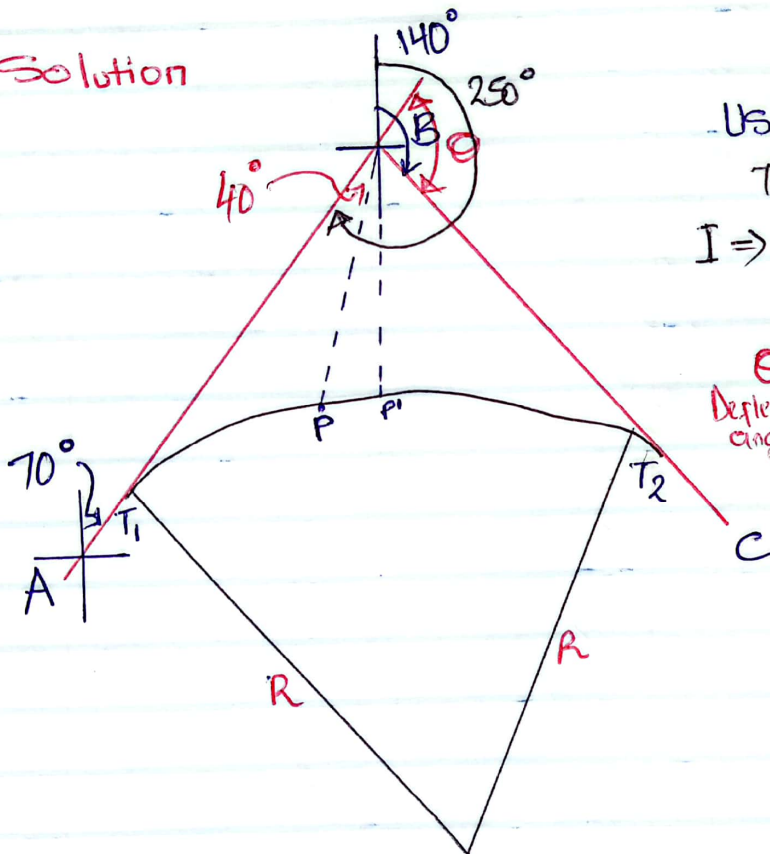


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 MATILI TECHNICAL - KIMILILI
 # 2024

2 straight AB and BC are to be connected by the right hand circular curve. The bearings of AB and BC are 70° and 140° respectively. The curve is to pass through a point P at a distance of 120m from B. Angle ABP is 40° . Determine the Radius.

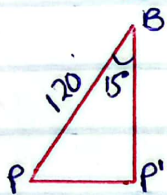
Solution



Using Back bearing (AB)
 $70 + 180 \Rightarrow 250^\circ$
 $I \Rightarrow 250 - 140$
 $\Rightarrow 110^\circ$
 $\theta = 180 - 110^\circ$
 Deflection angle $\Rightarrow 70^\circ$

From $ABP = 40^\circ$ and half of angle of Intersection we can form a right angle triangle.

$$I = 110^\circ \div 2 = 55^\circ - 40^\circ \Rightarrow 15^\circ$$



SOHCAHTOA $120 \times \cos 15^\circ = \frac{A}{120} \times 120$

$$(BP')_A = 120 \cos 15^\circ$$

$$\text{External distance } (BP') \Rightarrow 115.91 \text{ m}$$

$$115.91 = R \left(\sec \frac{70}{2} - 1 \right)$$

$$115.91 = R \left(\frac{1}{\cos \frac{70}{2}} - 1 \right)$$

$$R \Rightarrow 525 \text{ m}$$