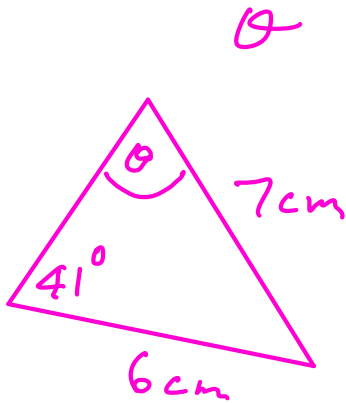


Sine and Cosine Rules, Area of Triangle Hwk Solutions

1)



Sine Rule

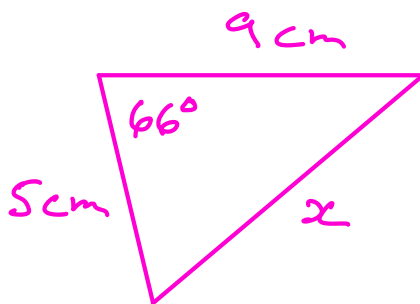
$$\frac{6}{\sin \theta} = \frac{7}{\sin 41^\circ}$$

$$\frac{\sin \theta}{6} = \frac{\sin 41^\circ}{7}$$

$$\sin \theta = \frac{\sin 41^\circ}{7} \times 6 = 0.5623$$

$$\theta = \sin^{-1}(0.5623) = 34.2^\circ$$

2)



Cosine rule

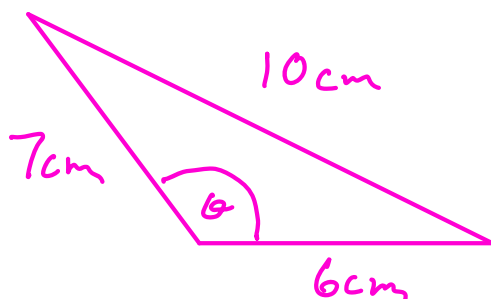
$$x^2 = 5^2 + 9^2 - 2 \times 5 \times 9 \cos 66$$

$$x^2 = 66.39$$

$$x = \sqrt{66.39}$$

$$x = 8.33 \text{ cm}$$

3)



cosine rule

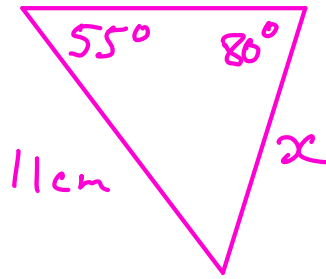
$$\cos \theta = \frac{7^2 + 6^2 - 10^2}{2 \times 7 \times 6} = -\frac{5}{28}$$

$$\theta = \cos^{-1}\left(-\frac{5}{28}\right)$$

$$\theta = 100.3^\circ$$

Sine rule

4)

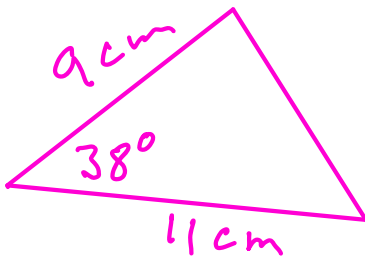


$$\frac{x}{\sin 55^\circ} = \frac{11}{\sin 80^\circ}$$

$$x = \frac{11}{\sin 80^\circ} \times \sin 55^\circ$$

$$x = 9.15\text{ cm}$$

5)

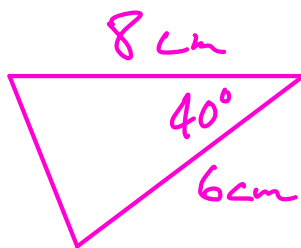


$$\text{Area} = \frac{1}{2} ab \sin C$$

$$= \frac{1}{2} \times 9 \times 11 \times \sin 38^\circ$$

$$= 30.5\text{ cm}^2$$

6)

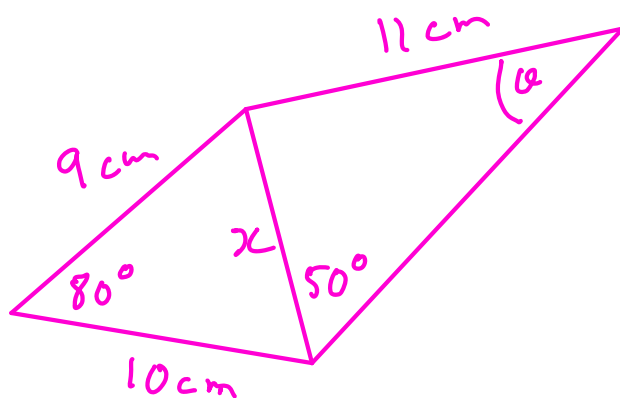


$$\text{Area} = \frac{1}{2} ab \sin C$$

$$= \frac{1}{2} \times 6 \times 8 \times \sin 40^\circ$$

$$= 15.4\text{ cm}^2$$

7)



Find x then α

cosine rule

$$x^2 = 9^2 + 10^2 - 2 \times 9 \times 10 \cos 80^\circ$$

$$x^2 = 149.74$$

$$x = \sqrt{149.74} = 12.24 \text{ cm}$$

Sine rule

$$\frac{12.24}{\sin \theta} = \frac{11}{\sin 50^\circ}$$

$$\frac{\sin \theta}{12.24} = \frac{\sin 50^\circ}{11}$$

$$\sin \theta = \frac{\sin 50^\circ}{11} \times 12.24 = 0.8522$$

$$\theta = \sin^{-1}(0.8522)$$

$$\theta = 58.5^\circ$$
