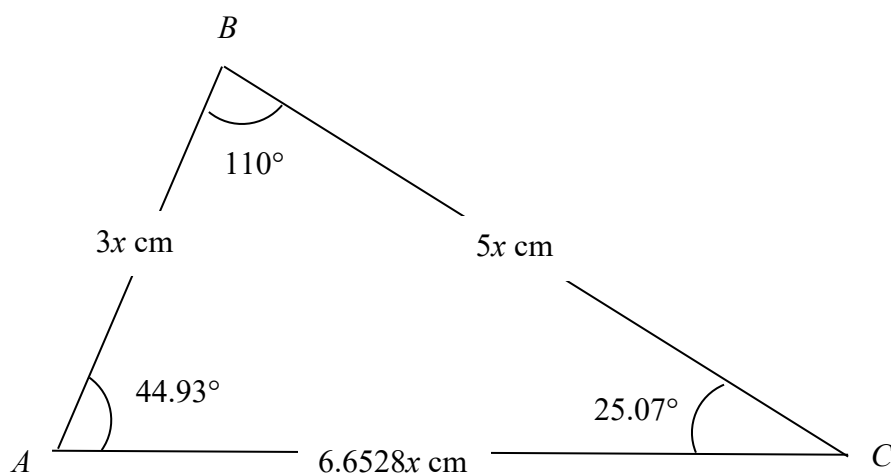


Question	Scheme	Marks
2(a)	$AC = \sqrt{(3x)^2 + (5x)^2 - 2 \times 3x \times 5x \times \cos 110^\circ} = 6.6528...x$	M1A1
	$\sin \angle BCA = \frac{3x \sin 110^\circ}{6.6528'x} = 0.4237... \Rightarrow \angle BCA = 25.07...^\circ$	M1
	Accept awrt 25.1°	A1 [4]
	ALT (for 2 nd M1 A1) $\cos \angle BCA = \frac{(5x)^2 + (6.6528'x)^2 - (3x)^2}{2 \times 5x \times 6.6528'x} = 0.9057... \Rightarrow \angle BCA = 25.07^\circ$ Accept awrt 25.1°	[M1 A1]
(b)	$24 = \frac{1}{2} \times 3x \times 5x \times \sin 110^\circ$ $\Rightarrow x = \sqrt{\frac{24 \times 2}{3 \times 5 \times \sin 110^\circ}} = (1.84536...)$ Accept awrt 1.85	M1 M1 A1 [3]
Total 7 marks		

Useful sketch

Part	Mark	Notes
(a)	M1	For using a correct cosine rule for AC or AC^2 . Note, this is given in the formula sheet so must be correct for this mark.
	A1	For finding a length of $AC = 6.6528...x$ or $AC = \sqrt{44.26...x^2}$ accept awrt $6.7x$ or $\sqrt{44.3x^2}$ Note: Allow the missing x here and throughout their working This mark can be implied by sight of $AC = \sqrt{34x^2 - 30x^2 \cos 110}$ if they carry it through to find the angle in the next step. For example: $\sin \angle BCA = \frac{3x \sin 110^\circ}{\sqrt{34x^2 - 30x^2 \cos 110}}$
	M1	For using any appropriate trigonometry to find the size of angle BCA . For example; Sine Rule $\sin \angle BCA = \frac{3x \sin 110^\circ}{6.6528'x} = 0.4237... \Rightarrow \angle BCA = 25.07...^\circ$ Cosine Rule $\cos \angle BCA = \frac{(5x)^2 + (6.6529x)^2 - (3x)^2}{2 \times 5x \times 6.6529x} \Rightarrow \angle BCA = 25.07$ Allow a missing x from their working provided it is consistent. Do not allow for example $\sin \angle BCA = \frac{3x \sin 110^\circ}{6.6528'}$
	A1	For awrt 25.1°
	ALT – Uses sine rule	
	M1	Use of sine rule: $\frac{\sin(70-\theta)}{5x} = \frac{\sin \theta}{3x} \Rightarrow \left[\frac{\sin(70-\theta)}{\sin \theta} = \frac{5}{3} \right]$
	A1	Expands $\sin(70-\theta) = \sin 70 \cos \theta - \cos 70 \sin \theta$
	M1	Uses the tan identity and rearranges to make $\tan \theta$ the subject. $\frac{\sin 70 \cos \theta - \cos 70 \sin \theta}{\sin \theta} = \frac{5}{3}$ $\Rightarrow \frac{\sin 70}{\tan \theta} - \cos 70 = \frac{5}{3} \Rightarrow \tan \theta = \frac{\sin 70}{\cos 70 + \frac{5}{3}}$
	A1	For awrt 25.1°
	M1	For using the correct formula for the area of a triangle with the correct angle and side lengths. e.g., Can use AB and AC with $\angle ABC = 110^\circ$ or BC and AC with their $\angle BCA$ [25.1°] or AB and AC with their $(180^\circ - 110^\circ - 25.07^\circ = 44.93^\circ)$