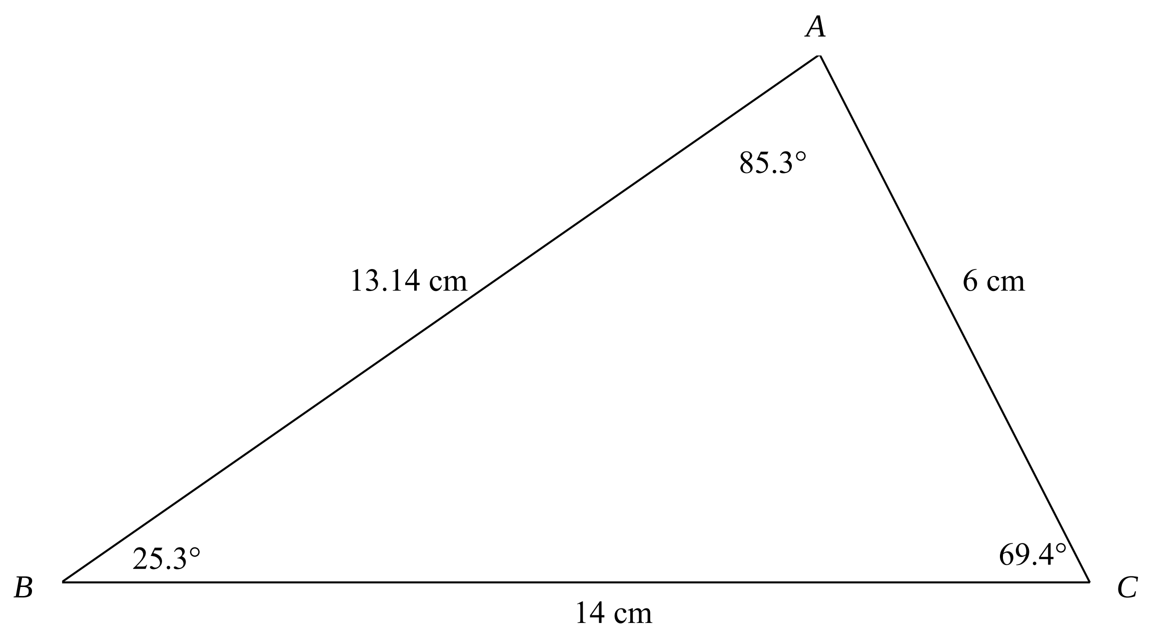
Question number	Scheme	Marks
4 (a)	$a\left(\sin x^\circ \cos 30^\circ - \sin 30^\circ \cos x^\circ\right) = b\left(\sin x^\circ \cos 30^\circ + \sin 30^\circ \cos x^\circ\right)$	M1
	$\Rightarrow a\left(\frac{\sqrt{3}}{2}\sin x^\circ - \frac{1}{2}\cos x^\circ\right) = b\left(\frac{\sqrt{3}}{2}\sin x^\circ + \frac{1}{2}\cos x^\circ\right)$	M1
	$\Rightarrow \sqrt{3}(a-b)\sin x^\circ = (a+b)\cos x^\circ$	dM1
	$\Rightarrow \tan x^\circ = \frac{(a+b)}{\sqrt{3}(a-b)}$	ddM1A1 (5)
(b)	$\frac{\sin(x-30)}{6} = \frac{\sin(x+30)}{14}$	M1
	$\tan x^\circ = \frac{14+6}{\sqrt{3}(14-6)} \Rightarrow x = 55.2849^\circ \approx 55.3^\circ$	M1A1
	Angles are; $\angle BAC = 85.284...^\circ, \angle ABC = 25.284...^\circ$ and $\angle ACB = 180 - 110.56...^\circ = 69.4^\circ$	B1 (4)
(c)	Area $= \frac{1}{2} \times 6 \times 14 \times \sin 69.43... = 39.3$ (cm^2)	M1A1 (2)
		[11]



Additional Notes

Part	Mark	Guidance
(a)	M1	Uses the given trig expansion to expand $\sin\left(x-30^\circ\right)$ and $\sin\left(x+30^\circ\right)$ These expansions must be correct for this mark. Accept $a\left[\sin x\cos\left(-30^\circ\right)+\cos x\sin\left(-30^\circ\right)\right]$ for this mark **Condone poor/missing brackets and *a* or *b* even missing for this mark**
	M1	Uses the exact values of $\cos 30^\circ$ $\left(\frac{\sqrt{3}}{2}\right)$ and $\sin 30^\circ$ $\left(\frac{1}{2}\right)$ to leave an equation in sin *x*, and cos *x* as a minimum **Condone poor/missing brackets and *a* or *b* even missing for this mark**
	dM1	Simplifies their equation to give a minimally acceptable $k\left(a-b\right)\sin x^\circ=\left(a+b\right)\cos x^\circ$ where *k* is a constant. This mark is dependent on the first M mark
	ddM1	Uses the given identity for tan *A* to form a minimally acceptable $\tan x^\circ=\frac{\left(a+b\right)}{k\left(a-b\right)}$ using their *k* This mark is dependent on the first M mark and the previous M mark.
	A1	For the final correct given identity. **Note: This is a show question.** There must be no errors for the award of this final A mark
(b)	M1	Uses a correct sine rule (either way around) to form the equation $\frac{\sin\left(x-30\right)}{6}=\frac{\sin\left(x+30\right)}{14}$ This must be correct for this mark.
	M1	Uses the **given** identity for tan *x*° to form an equation. Also accept $\tan x^\circ=\frac{6+14}{\sqrt{3}\left(6-14\right)}\Rightarrow x=........^\circ$
	A1	For $x=55.3^\circ$ or better Allow recovery from $x=-55.3^\circ$ if they clearly state $x=55.3^\circ$ as final answer
	B1	$\angle ACB=69.4^\circ$ cao
(c)	M1	Uses the correct formula for the area of a triangle with the correct given values of 6 cm and 14 cm with their $\angle ACB$ or as given in **ALT** if they find length *AB*. **Note:** $\angle ACB=180^\circ-\left('55.3'-30\right)^\circ-\left('55.3'+30\right)^\circ$ **ALT** $A=\frac{1}{2}\times6\times13.14\times\sin 85.3...=\left(39.3\right)$ or $A=\frac{1}{2}\times14\times13.14\times\sin 25.3...=\left(39.3\right)$
	A1	$A=39.3\ (\text{cm}^2)$

ALT – finds the perpendicular height and then uses half base × height.