Question	Scheme	Marks
2(a)	$AB = 21\,\text{cm}, BC = 13\,\text{cm}, \angle BAC = 25°, \angle ACB = x°$	
	$\frac{\sin x°}{21} = \frac{\sin 25°}{13}$ o.e	**M1**
	$\sin x° = 0.6827$ (awrt)	**A1**
		(2)
(b)	$\sin^{-1}(0.6827) = ...(43.05°)$	**M1**
	($AC < AB$ so $\angle ABC < \angle ACB$ so) required angle is $180° - \sin^{-1}(0.6827) = ...$	**M1**
	So x = awrt 136.95	**A1**
		(3)
		(5 marks)
Notes:		
Condone the omission of the ° symbol. Mark (a) and (b) as one		

(a)

M1: A correct statement of the sine rule with sides and angles in the correct position.

Implied by $\sin x° =$ awrt 0.68

A1: sin x ° = awrt 0.6827

ISW for instance if they go on to find the value of x in (a)

(b)

M1: Applies inverse sine to their value found in part (a) to find the angle in degrees (using degree mode) correct to nearest degree. For a correct (a) awrt 43° is sufficient

Implied by a correct answer for their value of sin x, either for the acute or the obtuse angle..

M1: Attempts to find the correct angle, $180° - \arcsin"0.6827"°$. Award even if other angles are given

No reasoning need be given, but may see diagram drawn, size of angles, or comparison of sides used.

A1: awrt 136.95 but it is A0 if two angles are given

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There are alternative methods so look at the candidates work carefully.

E.g.

Uses the cosine rule once to find AC

$$13^2 = 21^2 + y^2 - 2\times 21\times y\cos 25$$

$$y^2 - 38.1..y + 272 = 0$$

$$y = 9.533...$$

...and then a second time to find x

$$\cos x = \frac{13^2 + 9.533^2 - 21^2}{2\times 13\times 9.533} \Rightarrow x = 136.95°$$

In this solution both M's in part (b) are scored together.

To score marks in (a) (even though they haven't used the sine rule) they would need to simply find sin (their 136.95) for M1, and A1 for an accurate answer.

Question	Scheme	Marks
3(i)	Writes $\sqrt{180}$ as $6\sqrt{5}$ or $\sqrt{80}$ as $4\sqrt{5}$	M1
	Concludes working $\frac{6\sqrt{5}-4\sqrt{5}}{\sqrt{5}}=\frac{2\sqrt{5}}{\sqrt{5}}=2$	A1
		(2)
(ii)	$\frac{4\sqrt{5}-5}{7-3\sqrt{5}}=\frac{4\sqrt{5}-5}{7-3\sqrt{5}}\times\frac{7+3\sqrt{5}}{7+3\sqrt{5}}=...$	M1
	$=\frac{28\sqrt{5}-35+12\left(\sqrt{5}\right)^2-15\sqrt{5}}{49-9\times5}$	dM1
	$=\frac{25}{4}+\frac{13}{4}\sqrt{5}$	A1
		(3)
		(5 marks)
Notes: This is a non calculator question and all stages of working must be shown		

(i) Main method

M1: Writes $\sqrt{180}$ as $6\sqrt{5}$ or $\sqrt{80}$ as $4\sqrt{5}$.

Additional lines of working may be seen but they are not required for this mark

A1: Correct work leading to the answer 2. The M mark must have been awarded.

The solution shown in the main mark scheme is the minimum evidence required.

A valid alternative is $\frac{\sqrt{180}-\sqrt{80}}{\sqrt{5}}=\frac{6\sqrt{5}-4\sqrt{5}}{\sqrt{5}}=\left(\frac{6\sqrt{5}}{\sqrt{5}}-\frac{4\sqrt{5}}{\sqrt{5}}=\right)6-4=2$

(i) Alt method I $\frac{\sqrt{180}-\sqrt{80}}{\sqrt{5}}=\frac{\sqrt{180}}{\sqrt{5}}-\frac{\sqrt{80}}{\sqrt{5}}=\sqrt{36}-\sqrt{16}=6-4=2$

M1: Writes $\frac{\sqrt{180}}{\sqrt{5}}$ as $\sqrt{36}$ or $\frac{\sqrt{80}}{\sqrt{5}}$ as $\sqrt{16}$

Additional lines of working may be seen but they are not required

A1: Correct work leading to the answer 2. The solution shown below is the minimum evidence required

E.g. $\frac{\sqrt{180}}{\sqrt{5}}-\frac{\sqrt{80}}{\sqrt{5}}=\sqrt{36}-\sqrt{16}=6-4=2$

(i) Alt method II $\frac{\sqrt{180}-\sqrt{80}}{\sqrt{5}}\times\frac{\sqrt{5}}{\sqrt{5}}=\frac{\sqrt{900}-\sqrt{400}}{5}=\frac{30-20}{5}=2$

M1: Multiplies numerator and denominator by $\sqrt{5}$ and writes $\sqrt{180}\times\sqrt{5}$ as $\sqrt{900}$ or $\sqrt{80}\times\sqrt{5}$ as $\sqrt{400}$

A1: Correct work leading to the answer 2