Question	Scheme	Marks
3(a)	$BC^2 = 10^2 + 8^2 - 2 \times 10 \times 8 \times \cos 100º$ $BC = 13.848\ldots \approx 13.8$	M1 A1 [2]
(b)	(i) $\sin ABC = \dfrac{8\sin 100º}{13.848\ldots} \Rightarrow ABC = 34.6752\ldots º \approx 34.7º$ (ii) $\angle ACB = 180º - 100º - 34.6752\ldots º = 45.324\ldots º \approx 45.3º$	M1A1 B1FT [3]
	(i)(ii) $\cos ACB = \dfrac{8^2 + 13.848\ldots^2 - 10^2}{2 \times 8 \times 13.848\ldots} \Rightarrow ACB = 45.330\ldots$ $\qquad ABC = 180º - 100º - 45.330\ldots = 34.6699\ldots$	[M1A1 B1FT]
(c)	$\angle MBC = 34.675 \div 2 = 17.337\ldots º$ and $\angle BMC = 180º - 17.337º = 117.33\ldots º$ $MC = \dfrac{13.848\sin 17.337º}{\sin 117.33º} = 4.6293\ldots$ Area of $BMC =$ $\dfrac{1}{2} \times 4.629 \times 13.848 \times \sin 45.324º = 22.79\ldots \approx 22.8\,(\text{cm}^2)$	B1FT M1 M1A1 [4]
	ALT	
	$ABM = 34.675 \div 2 = 17.337\ldots º$ and $AMB = 180 - 100 - 17.33\ldots = 62.66\ldots$ $BM = \dfrac{10\sin 100}{\sin 62.66\ldots} = 11.086\ldots$ Area of $BMC =$ $\dfrac{1}{2} \times 13.848\ldots \times 11.086\ldots \times \sin 17.337\ldots = 22.87\ldots$ $\qquad\qquad\qquad\qquad\qquad\qquad \approx 22.9\,(\text{cm}^2)$	[B1FT M1 M1A1]
		Total 9 marks

Part	Mark	Notes
(a)	M1	For applying the cosine rule correctly to obtain BC^2
	A1	For awrt 13.8 (cm)
(b)(i)	M1	For applying the sine rule correctly to find angle ABC Accept any appropriate trigonometry. $\dfrac{\sin ABC}{8} = \dfrac{\sin 100}{13.8}$ leading to $ABC = 34.8$ is M1A0
	A1	For awrt 34.7º
(ii)	B1FT	For awrt 45.3º FT $180 - 100 - their\ 34.3752\ldots$ $0 < their\ 34.3752\ldots < 80$

ALT		
(b)(i)(ii)	M1	For applying cosine rule correctly to find angle *ACB* Accept any appropriate trigonometry.
	A1	For awrt 45.3º (angle *ACB*)
	B1FT	FT 180 − 100 − *their* 45.330 ... (angle *ABC*)
(c)	B1ft	For both angles *MBC* and *BMC*
	M1	For applying the sine rule using their angles and *BC* to find length *MC* Allow alternative correct methods to find *MC*.
	M1	For using Area = $\dfrac{1}{2}ab\sin C$ using their length and angles. *Their MC* $\neq$ 4
	A1	Awrt 22.8 or awrt 22.9
ALT		
(c)	B1ft	For both angles *ABM* and *AMB*
	M1	For applying sine rule using their angles to find length *BM*. Allow alternative correct methods to find *BM*.
	M1	For using Area = $\dfrac{1}{2}ab\sin C$ using their length and angles. *Their MC* $\neq$ 4 if used.
	A1	Awrt 22.8 or awrt 22.9