Question	Answer	Marks	Guidance
5(a)	$AD^2 = \left(\sqrt{7}-2\right)^2 + \left(\sqrt{7}+2\right)^2$ soi, oe	**B1**	
	$AD^2 = 11 - 4\sqrt{7} + 11 + 4\sqrt{7}$ or $AD = \sqrt{11 - 4\sqrt{7} + 11 + 4\sqrt{7}}$	**B1**	This is the minimum detail that is acceptable for this mark
	Perimeter = $18\sqrt{7} + \sqrt{22} - 14$ isw	**B1**	Allow if previous **B** mark not awarded because of lack of detail.
5(b)	$\frac{1}{2}\left(8\sqrt{7} - 7 + 9\sqrt{7} - 9\right)\left(\sqrt{7}+2\right)$ oe	**B1**	
	$\frac{1}{2}\left(119 + 18\sqrt{7} - 32\right)$	**B1**	This is the minimum detail that is acceptable
	$9\sqrt{7} + \frac{87}{2}$ oe isw	**B1**	Allow if previous **B** mark not awarded because of lack of detail. Must be 2 separate terms.
	Alternative 1		
	Area of triangle = $\frac{3}{2}$	**(B1)**	
	Area of rectangle = $\left(8\sqrt{7} - 7\right)\left(\sqrt{7}+2\right)$ $= 56 + 9\sqrt{7} - 14$	**(B1)**	This is the minimum detail that is acceptable
	$9\sqrt{7} + \frac{87}{2}$ oe isw	**(B1)**	Allow if previous **B** mark not awarded because of lack of detail.
	Alternative 2		
	Area of triangle = $\frac{3}{2}$	**(B1)**	
	Area of outer rectangle = $\left(9\sqrt{7} - 9\right)\left(\sqrt{7}+2\right)$ $= 63 + 9\sqrt{7} - 18$	**(B1)**	This is the minimum detail that is acceptable
	$9\sqrt{7} + \frac{87}{2}$ oe isw		Allow if previous **B** mark not awarded because of lack of detail.

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Question	Answer	Marks	Guidance
5(c)	$\cot\theta = \frac{\sqrt{7}+2}{9\left(\sqrt{7}-1\right)}$ or $\frac{1}{9\left(3-\sqrt{7}\right)}$ oe	**B1**	May have factors of 9 multiplied out
	$\frac{\left(\sqrt{7}+2\right)}{9\left(\sqrt{7}-1\right)} \times \frac{\left(\sqrt{7}+1\right)}{\left(\sqrt{7}+1\right)}$ or $\frac{\left(3+\sqrt{7}\right)}{9\left(3-\sqrt{7}\right)\left(3+\sqrt{7}\right)}$	**M1**	For rationalisation of *their* $\cot\theta$
	$\frac{\sqrt{7}}{18}+\frac{1}{6}$	**A1**	
	Alternative		
	$\cot\theta = \frac{\sqrt{7}+2}{9\left(\sqrt{7}-1\right)}$	**(B1)**	
	$\sqrt{7}+2 = \left(r\sqrt{7}+s\right)\left(9\left(\sqrt{7}-1\right)\right)$ $1 = -9r+9s$ $2 = 63r-9s$	**(M1)**	Obtain 2 simultaneous equations from *their* $\cot\theta$. Allow one error
	$\frac{\sqrt{7}}{18}+\frac{1}{6}$	**(A1)**	
6(a)	$5\theta = 3.75$ so $\theta = 0.75$ **AG**	**B1**	Allow $\theta = \frac{3.75}{5}$ as a starting point

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