Question	Answer	Marks	Guidance
2	$rs = 6561$ isw	**3**	**B2** for $\log_3 rs = 8$ or $\log_3 (rs)^2 = 16$ **B1** for $2\log_9 s = \frac{2\log_3 s}{\log_3 9}$ soi
	Alternative 1		
	$rs = 6561$ isw	**(3)**	**B2** for $\log_9 rs = 4$ or $\log_9 (rs)^2 = 8$ **B1** for $\log_3 r = \frac{\log_9 r}{\log_9 3}$ soi
	Alternative 2		
	$rs = 6561$ isw	**(3)**	**B2** for $\log rs = 8\log 3$ or $\log rs = 4\log 9$ for any base **B1** for $\frac{\log r}{\log 3} + \frac{2\log s}{\log 9} = 8$ soi for any base
3	$\frac{dy}{dx} = \frac{1}{2}\sec^2\frac{x}{2}$ or $\frac{1}{2\cos^2\left(\frac{x}{2}\right)}$	**2**	**M1** for $k\sec^2\frac{x}{2}$ or $\frac{k}{\cos^2\left(\frac{x}{2}\right)}$, $k \neq \frac{1}{2}$
	$\sec^2\frac{\pi}{6} = \frac{4}{3}$ or $\cos^2\left(\frac{\pi}{6}\right) = \frac{3}{4}$ soi	**B1**	
	$\frac{dy}{dx} = \frac{2}{3}$	**A1**	
4(a)	6435	**B1**	
4(b)	9	**B1**	
4(c)	${}^6C_2 \times {}^5C_2$ (150)	**B1**	
	${}^6C_3 \times {}^5C_3 \times {}^4C_2$ (1200)	**B1**	
	${}^6C_4 \times {}^5C_4$ (75)	**B1**	
	Total: 1425	**B1**	**Dep** on all previous **B** marks

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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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