Question	Answer	Marks	Guidance
4(b)	$4x^2 + 4 + \frac{1}{x^2}$ soi	**B1**	
	Coefficient of x^2 $\left(their 4 \times their \frac{1}{256}\right)$ $+\left(their 4 \times their -\frac{1}{24}\right)$ $+\left(their \frac{7}{36}\right)$	**M1**	Allow one sign error, but must have 3 terms in x^2 only, with an attempt at addition.
	$\frac{25}{576}$	**A1**	
5(a)	$\frac{a\left(r^4-1\right)}{r-1} = 17\frac{a\left(r^2-1\right)}{r-1}$	**M1**	Allow equivalents Allow if 'a' terms missing (assume to have been cancelled)
	$\left(r^2-1\right)\left(r^2+1\right) = 17\left(r^2-1\right)$ or better $r^4 - 17r^2 + 16 = 0$ oe $r^3 + r^2 - 16r - 16 = 0$ oe	**M1**	**Dep M1** for a correct simplified equation in r only
	$r = 4$ only, from correct working	**A1**	
5(b)	$ar^5 = 64$	**M1**	For use of ar^5 with *their* positive r
	$a = 0.0625$ or $\frac{1}{16}$	**A1**	Must be exact A0 if $r=4$not from correct working in **(a)**
5(c)	Because $r>1$ oe	**B1**	**FT** on *their* $r>1$ Must have a value for r

Question	Answer	Marks	Guidance
6(a)	**Either** Starts with 8: 1680	**B1**	1680 must not be part of a product. May be implied by final answer
	Starts with 7 or 9: 2688	**B1**	May be implied by final answer
	Total: 4368	**B1**	
	Or Alternative 1 Starts with 7, 8 or 9 and ends in 1, 3 or 5: 3024	**(B1)**	Allow for 1008 three times May be implied by final answer
	Starts with 8 or 9 and ends in 7: 672 Starts with 7 or 8 and ends in 9: 672	**(B1)**	For both May be implied by final answer
	Total: 4368	**(B1)**	
	Or Alternative 2 13 ways of obtaining odd 5-digit numbers which start with 7, 8 or 9	**(B1)**	Needs to be part of a product. May be implied by final answer
	${}^{8}\mathrm{P}_{3}$ ways of arranging the remaining 3 digits: 336	**(B1)**	Needs to be part of a product. May be implied by final answer
	Total = $13\times336=4368$	**(B1)**	
	Or Alternative 3 Last digit is 7 or 9: 1344	**B1**	May be implied by final answer
	Last digit is 1, 3 or 5: 3024	**B1**	May be implied by final answer
	Total: 4368	**B1**	
	Or Alternative 4 ${}^{10}\mathrm{P}_{5}-\left({}^{9}\mathrm{P}_{4}\times7\right)-\left({}^{8}\mathrm{P}_{3}\times5\right)-\left({}^{8}\mathrm{P}_{3}\times4\right)$ $-\left({}^{8}\mathrm{P}_{3}\times5\right)$	**B2**	Must be complete
	Total: 4368	**B1**	
6(b)	$\frac{n!}{(n-3)!3!}=\frac{2n!}{(n-2)!2!}$ soi	**B1**	
	$(n-2)=6$ soi	**B2**	**Dep B1** on first **B** for $(n-2)$ soi **Dep B1** on first **B** for 6 soi
	$n=8$	**B1**	**Dep** on previous **B** marks