

Q	Marking instructions	AO	Marks	Typical solution
9(a)	Uses $0.2a = 60$ PI by $a = 300$	1.1a	M1	$0.2a = 60$ $a = 300$ $S_5 = \frac{300(1-0.2^5)}{1-0.2}$ $= 374.88$
	Deduces $a = 300$ PI by the use of $\frac{60}{0.2}$	2.2a	R1	
	Uses a complete method to find the sum of the five terms. For example Uses $S_n = \frac{a(1-r^n)}{1-r}$ with their $a \neq 60$, $r = 0.2$ and $n = 5$ Or Uses $S_n = \frac{a(1-r^n)}{1-r}$ with $a = 60$, $r = 0.2$ and $n = 4$ and adds their first term Or Uses their $a = 300$ and $r = 0.2$ to calculate all five terms and finds their sum $300 + 60 + 12 + 2.4 + 0.48$	3.1a	M1	
	Obtains $\frac{9372}{25}$ OE	1.1b	A1	
	Subtotal		4	

Q	Marking instructions	AO	Marks	Typical solution
9(b)(i)	States $(T_{\infty} =) \frac{a}{1-r}$ and $ar = 60$ or $a = \frac{60}{r}$ Or States $(T_{\infty} =) \frac{60/r}{1-r}$	3.1a	M1	$ar = 60 \Rightarrow a = \frac{60}{r}$ $T_{\infty} = \frac{a}{1-r}$ $= \frac{60}{r(1-r)}$ $= \frac{60}{r-r^2}$
	Completes a reasoned argument to show $T_{\infty} = \frac{60}{r-r^2}$ Must start from $(T_{\infty} =) \frac{a}{1-r}$ and $ar = 60$ or $a = \frac{60}{r}$ AG	2.1	R1	
	Subtotal		2	

Q	Marking instructions	AO	Marks	Typical solution
9(b)(ii)	Deduces $(r =) \frac{1}{2}$	2.2a	M1	$r-r^2$ is at its maximum when $r = \frac{1}{2}$ Maximum value of $r-r^2 = \frac{1}{4}$
	Deduces maximum value of $r-r^2 = \frac{1}{4}$	1.1b	R1	
	Subtotal		2	

Q	Marking instructions	AO	Marks	Typical solution
9(b)(iii)	Obtains $\frac{60}{r-r^2}$ provided their $r-r^2 \neq 0$ PI by 240	2.2a	M1	Min $T_{\infty} = \frac{60}{\frac{1}{4}} = 240$ Hence $T_{\infty} \geq 240$
	Deduces $T_{\infty} \geq 240$	2.2a	R1	
	Subtotal		2	

	Question 9 Total		10	
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