Question	Answer	Marks	Partial Marks
9(b)	$\frac{n(n-1)(n-2)(n-3)(n-4)(n-5)}{6!}\times\left(\frac{1}{2}\right)^6$	**B1**	
	$\frac{n(n-1)(n-2)(n-3)}{4!}\times\left(\frac{1}{2}\right)^4$	**B1**	
	Forms a correct equation with *their* coefficients in terms of n	**M1**	
	Simplifies their equation to $(n-4)(n-5)=240$ or better	**M1**	
	Factorises or attempts to solve *their* 3-term quadratic	**M1**	
	$n=20$	**A1**	
10(a)	$5(1+\tan^2 A)+14\tan A-8=0$ soi	**B1**	
	Solves or factorises *their* 3-term quadratic in tan$A$ oe	**M1**	
	11.3 and 108.4 or 11.30[99...] and 108.43[49...] rot to four or more decimal places	**A2**	with no extras in range; not from clearly wrong working but allow recovery from minor slips or **A1** for either, ignoring extras
10(b)	$4B-\frac{\pi}{8}=\sin^{-1}\left(-\frac{2}{5}\right)$ soi	**B1**	
	–0.411[516...] rot to three or more figs	**M1**	
	–0.00470[444...] rot to three or more figs	**A1**	
	–0.584[344...] rot to three or more figs	**A1**	
11(a)	$R=\frac{1}{2}(w+180)$	**B1**	
	$V=\frac{1}{3}\pi(\textit{their } R)^2(w+180)$ $-\frac{1}{3}\pi(90)^2(180)$	**M1**	
	Correct completion to given answer: $V=\frac{\pi}{12}(w+180)^3-486000\pi$	**A1**	

Question	Answer	Marks	Partial Marks
11(b)	$\frac{dV}{dw} = 3\frac{\pi}{12}(w+180)^2$ oe	**B1**	
	$\frac{dw}{dt} = \frac{dw}{dV} \times \frac{dV}{dt}$ soi	**M1**	
	$\frac{dw}{dt} = \frac{1}{their\left(\frac{dV}{dw}\right)\Big\vert_{w=10}} \times 10000$	**M1**	
	0.353 [cms^{-1}] or 0.3526[97...] [cms^{-1}] rot to four or more figs	**A1**	
12(a)(i)	$\frac{-(-\sin x)}{\cos^2 x}$ oe	**B2**	**B1** for $\frac{-\sin x}{\cos^2 x}$ oe
	Correct completion to given answer: tan$x$sec$x$	**B1**	dep on all previous marks having been awarded
12(a)(ii)	$\sqrt[4]{e^{3x}} = e^{\frac{3x}{4}}$ oe	**B1**	
	$\frac{3}{\cos x} - \int e^{\frac{3x}{4}} dx = \frac{3}{\cos x} - ke^{\frac{3x}{4}}$ oe	**M1**	
	$\frac{3}{\cos x} - \frac{4}{3}e^{\frac{3x}{4}} + c$ oe	**A1**	
12(b)	$\left[\ln(px+10)\right]_2^5 = \ln 2$	**M1**	
	$\ln(5p+10) - \ln(2p+10) = \ln 2$	**M1**	
	$\ln\left(\frac{5p+10}{2p+10}\right) = \ln 2$	**M1**	
	$5p+10 = 2(2p+10)$	**M1**	
	$p = 10$	**A1**	

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