Question	Answer	Marks	Guidance
9(b)	$\ln(3x + 2) = [\pm]\ 2$	**B1**	
	$e^2 = 3x + 2$	**M1**	**FT** $\ln(3x + 2) = k$, where $k > 0$
	$x = \frac{e^2 - 2}{3}$ as only solution	**A1**	
9(c)	$\ln(3\ln(3x + 2) + 2)$	**B1**	
	their$(3\ln(3x + 2) + 2) = e$	**M1**	**FT** *their* $gg(x)$ with at most one error
	$3\ln(3x + 2) + 2 = e$	**A1**	
	$\ln(3x + 2) = \frac{e - 2}{3}$ or 0.239[42…]	**M1**	**FT** *their* $a\ln(3x + 2) + b = e$, where a and b are non-zero constants
	$3x + 2 = e^{\frac{e-2}{3}}$ or $3x + 2 = 1.270[52…]$	**A1**	
	awrt −0.243	**A1**	
10(a)	$\left[v = \int \frac{-45}{(t+1)^2}\,dt = \right] \frac{-45(t+1)^{-1}}{-1} + C$ or better	**B2**	**B1** for $\left[v = \int \frac{-45}{(t+1)^2}\,dt = \right] k(t+1)^{-1}$
	$50 = \frac{their\,45}{0+1} + C$	**M1**	
	$[v =] \frac{45}{t+1} + 5$	**A1**	
10(b)	$[F(t) =] \quad [45\ln(t+1) + 5t]_1^{10}$	**B2**	**B1** for (*their* 45)$\ln(t + 1)$
	F(10) – F(1)	**M1**	**dep** on at least **B1**
	122 (m) or 121.7[13…] rot to 4 or more sf	**A1**	**dep** on all previous marks awarded

Question	Answer	Marks	Guidance
11(a)	1080	**3**	**M2** for a fully correct method e.g. [starts with 1, 2, 4, 5 and ends in 3, 6] $4 \times 6 \times 5 \times 4 \times 2$ or 960 **and** [starts with 3 and ends in 6] $1 \times 6 \times 5 \times 4 \times 1$ or 120 **OR** [ends with 6 and starts with 1, 2, 3, 4, 5] $5 \times 6 \times 5 \times 4 \times 1$ or 600 **and** [ends with 3 and starts with 1, 2, 4, 5] $4 \times 6 \times 5 \times 4 \times 1$ or 480 or **M1** for a partially correct method equivalent to one of the above two steps
11(b)	2160	**3**	**M2** for a fully correct method e.g. [starts with 1, 3, 5 and ends in 2, 4, 6, 8] $3 \times 6 \times 5 \times 4 \times 4$ or 1440 **and** [starts with 2 or 4 and ends in 6, 8 or one of 2 or 4] $2 \times 6 \times 5 \times 4 \times 3$ or 720 **OR** [ends with 6, 8 and starts with 1, 2, 3, 4, 5] $5 \times 6 \times 5 \times 4 \times 2$ or 1200 **and** [ends with 2, 4 and starts with 1, 3, 5 or one of 2 or 4] $4 \times 6 \times 5 \times 4 \times 2$ or 960 or **M1** for a partially correct method equivalent to one of the above two steps

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