Question	Answer	Marks	Partial Marks
3	$(5x + 4)^2 * (2x - 3)^2$ soi where * is any inequality sign or =	**M1**	
	$21x^2 + 52x + 7 * 0$	**A1**	
	Critical values: $-\frac{1}{7}$, $-\frac{7}{3}$ soi	**A1**	
	$-\frac{7}{3} \leqslant x \leqslant -\frac{1}{7}$ mark final answer	**A1**	**FT** *their* derived critical values
	Alternative method		
	$5x + 4 * 2x - 3$ oe soi and $5x + 4 * 3 - 2x$ oe soi where * is any inequality sign or =	**(M1)**	
	Critical values: $-\frac{1}{7}$, $-\frac{7}{3}$ soi	**(A2)**	**A1** for $-\frac{1}{7}$ or $-\frac{7}{3}$
	$-\frac{7}{3} \leqslant x \leqslant -\frac{1}{7}$ mark final answer	**(A1)**	**FT** *their* derived critical values
4	$[y =] \frac{1}{\text{cosec}\, 5x} = \sin 5x$ nfww	**B1**	
	$\int_0^{\frac{\pi}{5}} y \, dx = \left[-\frac{\cos 5x}{5} \right]_0^{\frac{\pi}{5}}$	**B1**	**FT** *their a*sin5*x*
	$-\frac{1}{5}\cos\left(5 \times \frac{\pi}{5}\right) - \left(-\frac{1}{5}\cos(5 \times 0)\right)$	**M1**	**FT** *their a*(*k*cos*bx*) where $k < 0$ or $k = \frac{1}{5}$
	$\frac{2}{5}$	**A1**	
5(a)	$1^3 - 2(1^2) - 19 + 20 = 0$	**1**	
5(b)	$(x - 1)(x^2 - x - 20)$	**M2**	**M1** for two terms correct in the quadratic factor
	$(x - 1)(x + 4)(x - 5)$	**A1**	
5(c)	$e^y = 1, e^y = 5$	**M1**	
	$y = 0, y = \ln 5$ mark final answer	**A1**	1.61 or decimal equivalent for ln5 seen is A0 as calculator use not permitted

Question	Answer	Marks	Partial Marks
6(a)(i)	$\frac{1}{8}$ or 0.125	**2**	**M1** for $64(0.5)^9$ oe
6(a)(ii)	$\frac{1023}{8}$ or 127.875	**2**	**M1** for $\frac{64(1-0.5^{10})}{1-0.5}$ oe
6(a)(iii)	128	**1**	
6(b)	$\frac{20}{2}\{2a+19d\}-400=2\times\frac{10}{2}\{2a+9d\}$ oe, soi	**M2**	**M1** for $\frac{20}{2}\{2a+19d\}$ or $\frac{10}{2}\{2a+9d\}$ soi
	$5a = a + 5d$ soi	**M1**	
	$d = 4$	**A1**	
	$a = 5$	**A1**	
	27 nfww	**B1**	must have earned all previous marks
7(a)	$\frac{\mathrm{d}}{\mathrm{d}x}(\cos^2 x)=-2\cos x\sin x$ soi	**B1**	
	Attempts the quotient rule $\frac{\mathrm{d}y}{\mathrm{d}x}=\frac{-2\cos x\sin x\tan x-(1+\cos^2 x)\sec^2 x}{\tan^2 x}$	**M1**	**FT** *their* $\frac{\mathrm{d}}{\mathrm{d}x}(\cos^2 x)$
	Fully correct isw	**A1**	**FT** *their* $\frac{\mathrm{d}}{\mathrm{d}x}(\cos^2 x)$ only
	$\frac{\delta y}{h}\approx \textit{their}\left.\frac{\mathrm{d}y}{\mathrm{d}x}\right\|_{x=\frac{\pi}{4}}$	**M1**	
	$\delta y \approx -4h$ cao	**A1**	