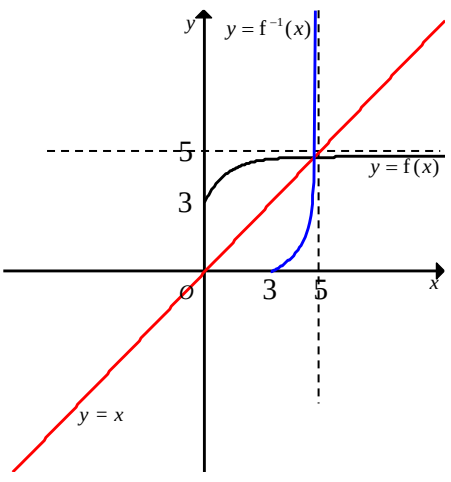
Question	Answer	Marks	Partial Marks
6(a)(i)	$\frac{1}{8}$ or 0.125	**2**	**M1** for $64(0.5)^9$ oe
6(a)(ii)	$\frac{1023}{8}$ or 127.875	**2**	**M1** for $\frac{64(1-0.5^{10})}{1-0.5}$ oe
6(a)(iii)	128	**1**	
6(b)	$\frac{20}{2}\{2a+19d\}-400=2\times\frac{10}{2}\{2a+9d\}$ oe, soi	**M2**	**M1** for $\frac{20}{2}\{2a+19d\}$ 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**	

Question	Answer	Marks	Partial Marks
7(a)	**Alternative method 1**		
	$\frac{\mathrm{d}}{\mathrm{d}x}(\cos^3 x) = -3\cos^2 x \sin x$ soi	**(B1)**	
	Attempts the quotient rule: $\frac{\mathrm{d}y}{\mathrm{d}x} = \frac{(\sin x)(-\sin x - 3\cos^2 x \sin x) - (\cos x + \cos^3 x)\cos x}{\sin^2 x}$	**(M1)**	**FT** *their* $\frac{\mathrm{d}}{\mathrm{d}x}(\cos^3 x)$
	Fully correct isw	**(A1)**	**FT** *their* $\frac{\mathrm{d}}{\mathrm{d}x}(\cos^3 x)$ 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)**	
	Alternative method 2		
	$\frac{\mathrm{d}}{\mathrm{d}x}\left(\frac{2}{\tan x}\right) = -2(\tan x)^{-2}\sec^2 x$	**(B1)**	
	Attempts the product rule $\frac{\mathrm{d}y}{\mathrm{d}x} = -2(\tan x)^{-2}\sec^2 x - (\sin x(-\sin x) + \cos x(\cos x))$	**(M1)**	**FT** *their* $\frac{\mathrm{d}}{\mathrm{d}x}\left(\frac{2}{\tan x}\right)$
	Fully correct isw	**(A1)**	**FT** *their* $\frac{\mathrm{d}}{\mathrm{d}x}\left(\frac{2}{\tan x}\right)$ 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)**	

Question	Answer	Marks	Partial Marks
7(b)	$\frac{dy}{dx} = -3(x-3)^{-4}$ oe, soi	**B1**	
	$\frac{d^2y}{dx^2} = -4\times -3(x-3)^{-5}$ oe, soi	**B1**	
	$\frac{(x-3)^2+3(x-3)-4}{(x-3)^5}$ or $\left[\frac{x-3+3}{(x-3)^4} - \frac{4}{(x-3)^5} = \right]\frac{x(x-3)-4}{(x-3)^5}$	**M1**	**FT** $\frac{dy}{dx} = k(x-3)^{-4}$ and $\frac{d^2y}{dx^2} = m(x-3)^{-5}$ where k and m are constants
	Correct completion to given answer: $\frac{x^2-3x-4}{(x-3)^5} = \frac{(x+1)(x-4)}{(x-3)^5}$	**A1**	
8(a)(i)	$3 \leqslant x < 5$	**B2**	**B1** for $x \geqslant 3$ or for $x < 5$ or for 3 and 5 in an incorrect inequality
8(a)(ii)	$x = \sqrt{5x-4}$ and rearrangement to $x^2 - 5x + 4[=0]$	**B1**	
	Factorises $x^2 - 5x + 4$ or solves *their* $x^2 - 5x + 4 = 0$	**M1**	
	$x = 4$ only, nfww	**A1**	
8(a)(iii)	Correct pair of graphs. 	**4**	**B1** for correct shape for f; may not be over correct domain but must have positive y-intercept and appear to tend to an asymptote in the 1st quadrant **B1** for (0, 3) and f in 1st quadrant only; must have attempted correct shape **B1** for asymptote at $y = 5$; must have attempted correct shape **B1** for a correct reflection of *their* f in the line $y = x$ **Maximum of 3 marks if not fully correct**