Question	Answer	Marks	Partial Marks
6(b)(ii)	$[p''(x) =] 6x + 2(their\ a)$ soi	**M1**	**FT** *their a*
	6(2) – 10 = 2 > 0 [therefore minimum]	**A1**	
7(a)	$\frac{1}{2} \times 9^2 \times \theta - \frac{1}{2} \times 5^2 \times \theta = 4\pi$ oe, soi	**M2**	**M1** for $\frac{1}{2} \times 9^2 \times \theta$ or $\frac{1}{2} \times 5^2 \times \theta$ oe, soi
	$\theta = \frac{\pi}{7}$ oe or 0.449 or 0.4487 to 0.4488	**A1**	
7(b)	[Arc AD =] $\frac{5\pi}{7}$	**2**	**M1** for [Arc AD =] $5 \times their \frac{\pi}{7}$ **FT** any stated value of θ from **(a)**
	[AC =] 4.991[27...] rot to 4 or more sf	**2**	**M1** for $[AC^2 =] 9^2 + 5^2 - 2(9)(5)\cos\left(their \frac{\pi}{7}\right)$ **FT** *their* θ providing $0 < \theta < \frac{\pi}{2}$
	11.2 or 11.23[526...] rot to 4 or more sf	**A1**	
8	$\int \cos\left(4x - \frac{\pi}{4}\right) dx = \frac{1}{4}\sin\left(4x - \frac{\pi}{4}\right)(+c)$	**B2**	**B1** for $k\sin\left(4x - \frac{\pi}{4}\right)$ where $k > 0$ or $k = -\frac{1}{4}$
	$\frac{3}{4} = \frac{1}{4}\sin\left(4\left(\frac{3\pi}{16}\right) - \frac{\pi}{4}\right) + c$	**M1**	**FT** *their k* providing **B1** awarded
	$-\frac{1}{16}\cos\left(4x - \frac{\pi}{4}\right) + \frac{1}{2}x \quad (+A)$	**2**	**M1 FT** for $m\cos\left(4x - \frac{\pi}{4}\right) + \left(their \frac{1}{2}\right)x \quad (+A)$ **FT** $their\ k\sin\left(4x - \frac{\pi}{4}\right) + their\ c$ providing at least **B1 M1** awarded
	$y = -\frac{1}{16}\cos\left(4x - \frac{\pi}{4}\right) + \frac{1}{2}x + \frac{5\pi}{32}$ oe, cao	**2**	**M1 FT** for $\frac{\pi}{4} = -\frac{1}{16}\cos\left(\frac{3\pi}{4} - \frac{\pi}{4}\right) + \frac{1}{2}\left(\frac{3\pi}{16}\right) + A$ **FT** $(their\ m)\cos\left(4x - \frac{\pi}{4}\right) + \left(their \frac{1}{2}\right)x + A$ providing previous **M1** awarded

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Question	Answer	Marks	Partial Marks
9	$\frac{dy}{dx} = -(3x-1)^{-2} \times 3$	**M2**	**M1** for $\frac{dy}{dx} = -k(3x-1)^{-2}$ where $k > 0$
	[When $x = 1$] $\frac{dy}{dx} = -\frac{3}{4}$ and $y = \frac{9}{2}$	**A1**	**FT** *their* $\frac{dy}{dx}$ providing **M1** has been awarded
	Equation of tangent: $y - \frac{9}{2} = -\frac{3}{4}(x-1)$ oe isw	**M1**	**FT** the value of *their* $\frac{dy}{dx}$ at $x = 1$ and *their y*
	$B(7, 0)$ oe	**A1**	
	Area of triangle: $\frac{1}{2} \times \frac{9}{2} \times \left((their 7) - 1\right)$ or $\frac{27}{2}$ nfww or $-\frac{3}{8}(49) + \frac{21}{4}(7) - \left(-\frac{3}{8} + \frac{21}{4}\right)$	**M1**	**FT** *their* 7 and *their* $-0.75x + 5.25$ of the form $mx + c$ if needed
	[Area under curve = F(x) =] $\left[4x + \frac{1}{3}\ln(3x-1)\right]_1^9$ oe	**B2**	**B1** for $\int \frac{1}{3x-1}\,dx = k\ln(3x-1)$ or $\frac{1}{3}\ln 3x - 1$
	Correct and actioned plan e.g. F(9) – F(1) – *their* $\frac{27}{2}$	**M1**	**dep** on at least previous **B1** and correct plan or correct **FT** area of triangle oe
	$18\frac{1}{2} + \frac{1}{3}\ln 13$ or 19.4 or 19.35[49...]	**A1**	
10	$\overrightarrow{OP} = \lambda(\mathbf{a} + \mathbf{c})$ oe	**B1**	
	$\overrightarrow{OP} = \mathbf{a} + \mu\left(-\mathbf{a} + \frac{2}{5}\mathbf{c}\right)$ oe	**B2**	**B1** for $\overrightarrow{OP} = \mathbf{a} + \mu\left(-\mathbf{a} + \left(their \frac{2}{5}\right)\mathbf{c}\right)$
	Equates components at least once: $\lambda = 1 - \mu$ or $\lambda = \frac{2}{5}\mu$	**M1**	**FT** providing at least **B1** awarded
	Equates components: $\lambda = 1 - \mu$ and $\lambda = \frac{2}{5}\mu$	**A1**	
	$\mu = \frac{5}{7}$ $\lambda = \frac{2}{7}$ and $DP : PA = 2 : 5 = OP : PB$ oe	**A2**	**A1** for $\mu = \frac{5}{7}$ or $\lambda = \frac{2}{7}$

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