Question	Answer	Marks	Partial marks
4(a)	$\left[\frac{dy}{dx}=\right]$ $4\left(\cos 2x(2\cos 2x)+\sin 2x(-2\sin 2x)\right)$ oe	**M1**	Use of the product rule with correct structure
	$\left[\frac{dy}{dx}=\right]$ $4\left(\cos 2x(2\cos 2x)+\sin 2x(-2\sin 2x)\right)$ oe, isw	**A1**	
	$\left[\left.\frac{dy}{dx}\right\|_{x=\frac{\pi}{6}}=\right] 4\left(2\cos^2\frac{2\pi}{6}-2\sin^2\frac{2\pi}{6}\right)$ oe	**M1**	**dep** on previous **M1** **FT** *their* $\frac{dy}{dx}$ providing it is of the form $a\cos^2 2x - b\sin^2 2x$ or equivalent where *a, b* are positive integers
	$\left[\left.\frac{dy}{dx}\right\|_{x=\frac{\pi}{6}}=\right] -4$	**A1**	

Question	Answer	Marks	Partial marks
4(b)	$\left[\text{When } x=\frac{\pi}{6}\right]\ y=\sqrt{3}$	**B1**	
	Gradient of normal = $\frac{1}{4}$	**M1**	**FT** $\frac{-1}{\textit{their}\left.\frac{\mathrm{d}y}{\mathrm{d}x}\right\|_{x=\frac{\pi}{6}}}$ from part **(a)**
	Equation of normal: $y=\frac{1}{4}x+\sqrt{3}-\frac{\pi}{24}$ or $y=\frac{1}{4}x+c$ and $\sqrt{3}=\frac{1}{4}\left(\frac{\pi}{6}\right)+c$ or $y-\sqrt{3}=\frac{1}{4}\left(x-\frac{\pi}{6}\right)$ oe	**M1**	**FT** $\frac{-1}{\textit{their}\left.\frac{\mathrm{d}y}{\mathrm{d}x}\right\|_{x=\frac{\pi}{6}}}$ and *their y* , providing *their y* ≠ 0
	$0-\sqrt{3}=\frac{1}{4}\left(x-\frac{\pi}{6}\right)$	**M1**	**FT** *their* equation of normal providing gradient is $\frac{-1}{\textit{their}\left.\frac{\mathrm{d}y}{\mathrm{d}x}\right\|_{x=\frac{\pi}{6}}}$
	$\left(\frac{\pi}{6}-4\sqrt{3},0\right)$ or exact equivalent; mark final answer	**A1**	**dep** on all previous marks awarded and a fully correct solution to (a) or a correct derivative and gradient of tangent at $x=\frac{\pi}{6}$ stated in this part
5(a)(i)	300	**B1**	
5(a)(ii)	252	**2**	**M1** for 21 × 4 × 3 × 1 oe OR Starts with 5 OR ends with 0: 1 × 4 × 3 × 5 oe or 60 or Starts with 2, 4, 6 or 8 OR ends with 2, 4, 6 or 8: 4 × 4 × 3 × 4 oe or 192 OR [All possible –] ends with 5: 4 × 4 × 3 × 1 oe or 48

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