Question Number	Scheme	Notes	Marks
8(a)	Asymptotes are $y = \pm 2x$	$y = \pm 2x$ oe e.g. $x = \pm\frac{y}{2}$	B1
			(1)
8(b)	$4 = e^2 - 1 \Rightarrow e = \sqrt{5}$	Uses the correct eccentricity formula with a = 1 and b = 2 to find a value for e.	M1
	Foci are $(\pm\sqrt{5}, 0)$	Both required.	A1
			(2)
8(c)	$8x - 2y\frac{\mathrm{d}y}{\mathrm{d}x} = 0 \Rightarrow \frac{\mathrm{d}y}{\mathrm{d}x} = \frac{4x}{y} = \frac{4\sec\theta}{2\tan\theta}$ or $\frac{\mathrm{d}y}{\mathrm{d}x} = \frac{\mathrm{d}y}{\mathrm{d}\theta} \times \frac{\mathrm{d}\theta}{\mathrm{d}x} = \frac{2\sec^2\theta}{\sec\theta\tan\theta}$ M1: $Ax + By\frac{\mathrm{d}y}{\mathrm{d}x} = 0 \Rightarrow \frac{\mathrm{d}y}{\mathrm{d}x} = \mathrm{f}(\theta)$ or $\frac{\mathrm{d}y}{\mathrm{d}x} = \frac{\mathrm{d}y}{\mathrm{d}\theta} \times \frac{\mathrm{d}\theta}{\mathrm{d}x} = \mathrm{f}(\theta)$ A1: Correct gradient in terms of θ		M1A1
	Explicit differentiation may be seen: $y^2 = 4x^2 - 4 \Rightarrow y = (4x^2 - 4)^{\frac{1}{2}} \Rightarrow \frac{\mathrm{d}y}{\mathrm{d}x} = \frac{1}{2}(4x^2 - 4)^{-\frac{1}{2}} \times 8x = \frac{4\sec\theta}{\sqrt{4\sec^2\theta - 4}}$ Score M1 for $\frac{\mathrm{d}y}{\mathrm{d}x} = kx(4x^2 - 4)^{-\frac{1}{2}} = \mathrm{f}(\theta)$ and A1 for correct gradient in terms of θ		
	E.g. $y - 2\tan\theta = \frac{4\sec\theta}{2\tan\theta}(x - \sec\theta)$	Correct straight line method using their gradient in terms of θ and $x = \sec\theta$, $y = 2\tan\theta$	M1
	$y\tan\theta - 2\tan^2\theta = 2x\sec\theta - 2\sec^2\theta$ $\Rightarrow y\tan\theta - 2\tan^2\theta = 2x\sec\theta - 2(1 + \tan^2\theta)$		
	$y\tan\theta = 2x\sec\theta - 2$*	Obtains the given answer with sufficient working shown as above.	A1cso
			(4)
8(d)	$VP: V(-1,0); P(\sec\theta, 2\tan\theta) \Rightarrow y = \frac{2\tan\theta}{\sec\theta + 1}(x + 1)$ or $WQ: W(1,0); Q(\sec\theta. - 2\tan\theta) \Rightarrow y = \frac{-2\tan\theta}{\sec\theta - 1}(x - 1)$ M1: Correct straight line method for either *VP* or *WQ* A1: One correct equation in any form		M1A1
	$y = \frac{-2\tan\theta}{\sec\theta - 1}(x - 1),\ y = \frac{2\tan\theta}{\sec\theta + 1}(x + 1)$	Both equations correct in any form.	A1
	$\frac{2\tan\theta}{\sec\theta + 1}(x + 1) = \frac{-2\tan\theta}{\sec\theta - 1}(x - 1) \Rightarrow x / y = \ldots$	Attempt to solve and makes progress to achieve either x = … or y = …in terms of θ only.	M1
	$x = \cos\theta$ or $y = 2\sin\theta$	One correct coordinate	A1
	$x = \cos\theta$ and $y = 2\sin\theta$	Both correct	A1
	$x^2 + \frac{y^2}{4} = 1$ or $a = 1, b = 2$	Correct equation or correct values for a and b	A1
			(7)
			Total 14

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