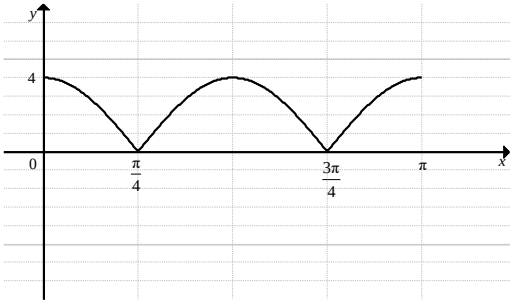
Question	Answer	Marks	Partial Marks
1	Correct sketch  	**3**	**B1** for correct shape, with 3 consistent maxima, 2 cusps on the *x*-axes and reasonable symmetry **B1** for $\left(\frac{\pi}{4},\ 0\right)$ and $\left(\frac{3\pi}{4},\ 0\right)$ either seen on the graph or stated; must have attempted a graph of correct shape **B1** for starts with (0, 4) **and** ends with (π, 4) and (0, 4) either seen on the graph or stated; must have attempted a graph correct shape
2	$\frac{11x^2}{12+1-4\sqrt{3}}$	**B1**	
	$\frac{11x^2\left(13+4\sqrt{3}\right)}{\left(13-4\sqrt{3}\right)\left(13+4\sqrt{3}\right)}$	**M1**	**FT** *their* expression of equivalent difficulty
	$\frac{11x^2\left(13+4\sqrt{3}\right)}{169-48}$ or $\frac{143x^2+44\sqrt{3}x^2}{169-48}$	**A1**	
	$\frac{x^2\left(13+4\sqrt{3}\right)}{11}$ or $\frac{13x^2+4\sqrt{3}x^2}{11}$	**A1**	mark final answer
	Alternative method		
	$\left(\frac{x\sqrt{11}(2\sqrt{3}+1)}{(2\sqrt{3}-1)(2\sqrt{3}+1)}\right)^2$	**(M1)**	
	$\left(\frac{x\sqrt{11}(2\sqrt{3}+1)}{12-1}\right)^2$ or $\left(\frac{2\sqrt{33}x+x\sqrt{11}}{12-1}\right)^2$	**(A1)**	
	$\frac{11x^2(12+1+4\sqrt{3})}{121}$ or $\frac{132x^2+11x^2+4\sqrt{363}x^2}{121}$	**(A1)**	
	$\frac{x^2\left(13+4\sqrt{3}\right)}{11}$	**(A1)**	mark final answer

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