Question Number	Scheme	Marks
9		
(a)	$\cos 2\theta = \cos^2\theta - \sin^2\theta$	
	$\cos 2\theta = \cos^2\theta - (1-\cos^2\theta)$	M1
	$\cos^2\theta = \frac{1}{2}(\cos 2\theta + 1)$ (*)	A1 cso (2)
(b)	$f(\theta) = 8\left(\frac{1}{2}(\cos 2\theta+1)\right)^2 + 4\times\frac{1}{2}(\cos 2\theta+1) - 5$	M1
	$= 2(\cos^2 2\theta + 2\cos 2\theta + 1) + 2\cos 2\theta + 2 - 5$	M1
	$= 2\times\frac{1}{2}(\cos 4\theta + 1) + 4\cos 2\theta + 2\cos 2\theta - 1$	M1
	$= \cos 4\theta + 6\cos 2\theta$ (*)	A1 cso (4)
(c)	$8\cos^4 x + 4\cos^2 x - 5 - 6\cos 2x = -0.5$	
	$\cos 4x + 6\cos 2x - 6\cos 2x = -0.5$	M1
	$\cos 4x = -0.5$	A1
	$4x = 120,\ 240,\ 480,\ 600$	M1
	$x = 30,\ 60,\ 120,\ 150$	A1 (4)
(d)(i)	$\int f(\theta)\,d\theta = \int (\cos 4\theta + 6\cos 2\theta)\,d\theta$	M1
	$= \frac{1}{4}\sin 4\theta + 3\sin 2\theta\ (+c)$	A1
(ii)	$\int_0^{\frac{\pi}{3}} f(\theta)\,d\theta = \frac{1}{4}\sin\frac{4\pi}{3} + 3\sin\frac{2\pi}{3}$	M1
	$-\frac{1}{4}\times\frac{\sqrt{3}}{2} + 3\times\frac{\sqrt{3}}{2},\ = \frac{11\sqrt{3}}{8}$	A1,A1 (5)
		[15]