Question			Answer	Marks	AOs		Guidance
8	(i)		**EITHER** $8\sin^2 x\cos^2 x = 2(1-\cos 2x)(1+\cos 2x)$ $= 2\left(1-\cos^2 2x\right) = 2-(1+\cos 4x)$ $= 1-\cos 4x$	**M1** **M1** **E1** **[3]**	**3.1a** **3.1a** **2.1**	**AG** Using a double angle formula Second use of a double angle formula Clearly shown	
	(i)		**OR** $8\sin^2 x\cos^2 x = 2\left(2\sin x\cos x\right)^2$ $= 2\sin^2 2x$ $[= 1-\cos 2(2x)] = 1-\cos 4x$	**M1** **M1** **E1** **[3]**		Using a double angle formula Another use of a double angle formula Clearly shown	Allow any other valid sequence of identities used.
	(i)		**OR** $1-\cos 4x = 1-\left(1-2\sin^2 2x\right)$ $= 2\sin^2 2x$ $= 2\left(2\sin x\cos x\right)^2$ $= 8\sin^2 x\cos^2 x$	**M1** **M1** **E1** **[3]**		Using a double angle formula Another use of a double angle formula Clearly shown	
	(ii)		$\int \sin^2 x\cos^2 x \, \mathrm{d}x = \frac{1}{8}\int 1-\cos 4x \, \mathrm{d}x$ $= \frac{1}{8}x - \frac{1}{32}\sin 4x + c$	**M1** **A1** **A1** **[3]**	**1.1a** **1.1b** **1.1b**	Attempt to integrate both terms $\frac{1}{4}\sin 4x$ seen or implied All correct. Must include $+c$	