Question Number	Scheme	Marks
3.	(a) (i) $\int (1+3x-\frac{2}{x^2})\mathrm{d}x = x+3\frac{x^2}{2}-2\frac{x^{-1}}{-1}[+c]$	M1 A1
	(ii) $\int_1^2 (1+3x-\frac{2}{x^2})\mathrm{d}x = \left[x+3\frac{x^2}{2}-2\frac{x^{-1}}{-1}\right]_1^2$	
	$=(2+6+1)-(1+\frac{3}{2}+2)=9-4\frac{1}{2}=4\frac{1}{2}$ *	M1 A1
	(b) (i) $\int 3\sin 2x\,\mathrm{d}x = \frac{-3\cos 2x}{2}[+c]$	M1 A1
	(ii) $\int_0^{\frac{\pi}{6}} 3\sin 2x\,\mathrm{d}x = \left[\frac{-3\cos 2x}{2}\right]_0^{\frac{\pi}{6}}$	
	$=-\frac{3}{2}(\cos\frac{\pi}{3}-\cos 0)$	M1
	$=-\frac{3}{2}(\frac{1}{2}-1)=\frac{3}{4}$ *	A1 (8)

Notes for Question 3

(a)

(i) M1 for attempting the integration, (at least one term must show an increase of power - see start of doc)

A1 for $x+3\frac{x^2}{2}-2\frac{x^{-1}}{-1}$ $(+c)$ No simplification needed, constant not needed

(ii) M1 for substituting the given limits in their result for (i). This is a "show" question and also states "hence", so the substitution **must** be seen.

A1cso for $4\frac{1}{2}$ * (Given answer, unlikely to be a correct solution if (i) not fully correct, but candidate may have integrated again and correctly this time (marks for (i) can be given as all in (a)). Also, check substitution correct.)

(b)

(i) M1 for attempting to integrate. $\cos 2x$ must be seen. Minus sign not needed. The $\frac{1}{2}$ may be omitted, but if $2\cos 2x$ is seen assume differentiation and award M0. (Should be $\pm 3\cos 2x$ or $\pm\frac{3}{2}\cos 2x$)

A1 for $\frac{-3\cos 2x}{2}$ $(+c)$ constant not needed

Alternative: (Not likely to be seen often)

M1 change to $\int 3\times 2\sin x\cos x\,dx$ and attempt to integrate. Must be attempting to integrate the **correct** function and $\pm\sin^2 x$ or $\pm\cos^2 x$ must be seen. Accept 3 or 6 but not 12

A1 for $3\sin^2 x$ or $-3\cos^2 x\ (+c)$

(ii) M1 for substituting the given limits (sub must be seen) in their result for (i). Can be in terms of cosines (or sines in alternative) or may go straight to the corresponding numbers (but not the final answer) Accept 0 for cos 0.

A1cso for $\frac{3}{4}$ * Not nec to see $-\frac{3}{4}+\frac{3}{2}$ for this mark.

As in (a), a candidate can re-start in (ii) and gain the marks for (i) if they have not already been awarded.