Question	Scheme	Marks
1	$\int x\cos 3x\,\mathrm{d}x = \frac{1}{3}x\sin 3x - \frac{1}{3}\int \sin 3x\,\mathrm{d}x$	**M1**
	$= \frac{1}{3}x\sin 3x + \frac{1}{9}\cos 3x$	**dM1 A1**
	$\int_0^{\frac{\pi}{6}} x\cos 3x\,\mathrm{d}x = \left[\frac{1}{3}x\sin 3x + \frac{1}{9}\cos 3x\right]_0^{\frac{\pi}{6}} = \frac{1}{3}\frac{\pi}{6}\sin\frac{\pi}{2} + \frac{1}{9}\cos\frac{\pi}{2} - \left(0 + \frac{1}{9}\right)$	**M1**
	$= \frac{\pi}{18} - \frac{1}{9}$	**A1**
		(5)
		(5 marks)

M1: Applies integration by parts in the correct direction to achieve $\alpha x\sin 3x \pm \beta\int \sin 3x\,\mathrm{d}x$

So do not penalise the appearance of a '+' sign unless they state $\int vu'\mathrm{d}x = uv + \int uv'\mathrm{d}x$ o.e.

dM1: Completes the process by integrating the sin3x term, achieving $\pm\alpha x\sin 3x \pm \beta\cos 3x$

A1: Correct integration which may be left un simplified. E.g. $\frac{1}{3}x\sin 3x - \frac{1}{3}\left(-\frac{1}{3}\cos 3x\right)$

May have been done in stages (allow if $\frac{1}{3}x\sin 3x$ and $+\frac{1}{9}\cos 3x$ are seen on separate lines.)

Ignore spurious notation as long as the intention is clear.

M1: Applies both the limits to their integral which must be of the form $\pm\alpha x\sin 3x \pm \beta\cos 3x$. The substitution must be seen, or clearly implied by the correct evaluation of their $\pm\alpha x\sin 3x \pm \beta\cos 3x$

If embedded limits are not seen first, then $\left[\pm\alpha x\sin 3x \pm \beta\cos 3x\right]_0^{\frac{\pi}{6}} = (...) - \underline{0}$ is M0

Condone the subtraction being done either way around.

A1: Correct simplified answer. ISW after a correct answer. Allow $\frac{\pi - 2}{18}$

Alt methods may be seen. E.g. D & I method

Differentiation	Integration
x	$\cos 3x$
1	$\frac{1}{3}\sin 3x$
0	$-\frac{1}{9}\cos 3x$

Score M1 dM1 for sight of $\pm\alpha x\sin 3x \pm \beta\cos 3x$