Question Number	Scheme	Marks
6.	$\frac{\mathrm{d}y}{\mathrm{d}x}+\frac{(x\cot x+2)}{x}y=\frac{4\sin x}{x^2}$	B1
	$\text{IF}=\mathrm{e}^{\int\frac{(x\cot x+2)}{x}\mathrm{d}x}$	M1
	$=\mathrm{e}^{(\ln\sin x+2\ln x)}$	A1
	$=x^2\sin x$	A1
	$\frac{\mathrm{d}}{\mathrm{d}x}(\text{their IF}\times y)=\text{their IF}\times\text{"}\frac{4\sin x}{x^2}\text{"}$	M1
	$yx^2\sin x=\int 4\sin^2 x\,\mathrm{d}x=4\int\frac{1-\cos 2x}{2}\mathrm{d}x=4\left(\frac{x}{2}-\frac{1}{4}\sin 2x\right)\quad(+C)$	dM1A1
	$y=\frac{2x-\sin 2x+C}{x^2\sin x}$ oe	A1cao **[8]**

B1	Divide through by x^2
M1	Attempt an IF of the form $\mathrm{e}^{\int\frac{k(x\cot x+2)}{x}\mathrm{d}x}$
A1	$(\ln\sin x+2\ln x)$
A1	Correct IF
M1	Multiply through by their IF and write LHS in form shown – can be implied by next line. Allow if IF is seen instead of their function provided an IF has been attempted. Allow use of their RHS
dM1	Attempt to integrate $\sin^2 x$, including using $\sin^2 x=\frac{1}{2}(1\pm\cos 2x)$ $\cos 2x\to k\sin 2x$ depends on previous M mark
A1	Correct integration, constant not needed
A1	Include the constant and treat it correctly. Must have y = ...