Question Number	Scheme	Marks
1.	$\int\left(3x+\frac{2}{x}\right)^2 \mathrm{d}x$	
	$\left(3x+\frac{2}{x}\right)^2 = 9x^2+12+4x^{-2}$	M1 A1
	$\int\left(3x+\frac{2}{x}\right)^2 \mathrm{d}x = \int\left(9x^2+12+4x^{-2}\right)\mathrm{d}x = 3x^3+12x-\frac{4}{x}+c$	M1 A1 A1
		(5 marks)

Notes

M1: Attempts to multiply out. Requires a minimum of $...x^2+\frac{...}{x^2}$ oe e.g. $...x^2+...x^{-2}$.

A1: For $9x^2+12+\frac{4}{x^2}$ oe e.g. $9x^2+12+4x^{-2}$ but allow this unsimplified with the terms uncollected e.g. $9x^2+6+6+\frac{4}{x^2}$ but **not** e.g. $9x^2+\frac{6x}{x}+\frac{6x}{x}+\frac{4}{x^2}$ i.e. the middle terms need to become 6's

M1: For an attempt to integrate a term in x following an attempt to expand.
It is for either $...x^2 \to ...x^3$ or $...x^{-2} \to ...x^{-1}$ but allow the index to be unprocessed, e.g. $...x^2 \to ...x^{2+1}$ or $...x^{-2} \to ...x^{-2+1}$
Do **not** allow for just e.g. $12 \to 12x$.
Condone poor notation e.g. missing integral signs and just look for the integrated terms.

A1: For at least 2 correct and simplified terms.
It is for any 2 of $3x^3$, $12x$ or $-\frac{4}{x}\left(\text{or } -4x^{-1}\right)$.
Condone $+\frac{4x^{-1}}{-1}$ for **this** mark.

A1: $3x^3+12x-\frac{4}{x}+c$ or exact simplified equivalent e.g. $3x^3+12x-4x^{-1}+c$ including the $+c$
Do **not** condone $+\frac{4x^{-1}}{-1}$ for this mark.
Ignore any spurious notation e.g. $\int\left(9x^2+12+4x^{-2}\right)\mathrm{d}x = \int 3x^3+12x-\frac{4}{x}+c$
Apply isw once a correct answer is seen.

<u>Attempts to combine the terms inside the brackets first:</u>

e.g. $\left(3x+\frac{2}{x}\right)^2 = \left(\frac{3x^2+2}{x}\right)^2 = \frac{9x^4+12x^2+4}{x^2} = 9x^2+12+\frac{4}{x^2}$

M1: Combines terms to obtain $\frac{...x^2+...}{x}$, squares numerator and denominator and writes as separate terms. Requires a minimum of $...x^2+\frac{...}{x^2}$ oe e.g. $...x^2+...x^{-2}$.
The rest of the marks can be applied as above.