Question Number	Scheme	Marks
3	$\int \frac{4x^5+3}{2x^2}\,\mathrm{d}x = \int 2x^3+\frac{3}{2}x^{-2}\,\mathrm{d}x$	M1 A1
	$=\frac{1}{2}x^4-\frac{3}{2}x^{-1}+c$	dM1 A1 A1
		(5)
		(5 marks)

M1: Attempts to write as **a sum of two terms** with one processed index correct.

Award for Px^3+Qx^k or Px^k+Qx^{-2} or $Px^k+\frac{Q}{x^2}$ where k could be 0 i.e. a constant term.

A1: Correct integrand written as a sum of two terms with indices processed. E.g. $2x^3+\frac{3}{2}x^{-2}$ seen in one expression.

Award for any exact equivalent such as $\frac{1}{2}\left(4x^3+\frac{3}{x^2}\right)$ or e.g. $\frac{4}{2}x^3+\frac{3}{2x^2}$ or e.g. $\frac{4x^3+3x^{-2}}{2}$

dM1: Attempts to integrate an expression of the form Px^m+Qx^n, $m=3$ or $n=-2$, raising one of the indices by one. Depends on the first M mark.

A1: Either term correct and simplified and from correct work: $\frac{1}{2}x^4+Ax^n\left(+c\right)$ or $Bx^m-\frac{3}{2}x^{-1}\left(+c\right)$

A1: $\frac{1}{2}x^4-\frac{3}{2}x^{-1}+c$. Allow simplified equivalents e.g. $\frac{1}{2}x^4-\frac{3}{2x}+c$, $0.5x^4-1.5x^{-1}+c$ but **not** e.g. $\frac{1}{2}x^4-\frac{\frac{3}{2}}{x}+c$ and **not** $\frac{1}{2}x^4+-\frac{3}{2}x^{-1}+c$.

Condone poor notation such as $\int \frac{1}{2}x^4-\frac{3}{2x}+c\left(\mathrm{d}x\right)$, $y=\frac{1}{2}x^4-\frac{3}{2x}+c$

You can ignore subsequent working if necessary e.g. award the marks once a correct answer is seen as a correct single expression.

Correct answer only scores full marks.

Question Number	Scheme	Marks
4	$kx^2+6kx+5=0$	
	$b^2-4ac=(6k)^2-4\times k\times 5$	M1
	$b^2-4ac=(6k)^2-4\times k\times 5...0\Rightarrow k...$	dM1
	$k<\frac{5}{9}$	A1
	$0<k<\frac{5}{9}$	A1
		(4 marks)

M1: Attempts to use b^2-4ac for the given quadratic with $b = 6k$, a = k and $c = 5$.

May be seen as part of the quadratic formula or may be implied by an attempt to solve e.g. $b^2=4ac$

Condone attempts where the "6" isn't squared e.g. $6k^2-4\times k\times 5$ but the k must be squared.

dM1: Dependent upon the previous M mark, it is for setting $b^2-4ac...0$ leading to a non-zero value for k from an "equation" of the form $\alpha k^2-\beta k...0$

Condone any of e.g. "=", "<", ">" etc. for "…" for this mark.

A1: For obtaining an upper limit for k of $\frac{5}{9}$ (not just the value) but condone $k\leqslant\frac{5}{9}$ which may be implied by e.g. $0<k<\frac{5}{9}$ or $0<k\leqslant\frac{5}{9}$. Allow exact equivalents for $\frac{5}{9}$ e.g. $\frac{10}{18}$ etc. Condone the use of x for this mark so allow e.g. $x\leqslant\frac{5}{9}$, $x<\frac{5}{9}$ Allow $0.\dot{5}$ for $\frac{5}{9}$

Allow the inequalities to be on separate lines e.g. $k<\frac{5}{9}$ $k>0$