Question	Scheme	Marks	AOs
1	$\frac{2\sqrt{x}}{x^2} \to ...x^{-\frac{3}{2}}$ or $\frac{-3}{x^2} \to ...x^{-2}$	M1	1.1b
	$\int \frac{2\sqrt{x}-3}{x^2}\,\mathrm{d}x = \int 2x^{-\frac{3}{2}} - 3x^{-2}\,\mathrm{d}x$	A1	1.1b
	$...x^{-\frac{3}{2}} \to ...x^{-\frac{1}{2}}$ or $...x^{-2} \to ...x^{-1}$	dM1	1.1b
	$\int 2x^{-\frac{3}{2}} - 3x^{-2}\,\mathrm{d}x = -4x^{-\frac{1}{2}} + 3x^{-1} + c$	A1	1.1b
		(4)	

(4 marks)

Notes

M1: For separating the fraction into two separate terms. Award for one correct index (which does not need to be processed. e.g. $...x^{\frac{1}{2}-2}$)

Note $-\frac{3}{x^2}$ is insufficient. They must write as $...x^{-2}$ or may be implied by further work.

Beware of candidates who integrate the numerator and denominator which results in a correct index but is an incorrect method and scores M0A0dM0A0

A1: $2x^{-\frac{3}{2}} - 3x^{-2}$ o.e. where the indices have been processed (may be implied by further work)

dM1: For raising the power by one on at least one term with a correct index. It is dependent on the previous method mark. The index does not need to be processed. e.g. $...x^{-\frac{3}{2}} \to ...x^{-\frac{3}{2}+1}$. It is not for $+c$.

A1: All correct, simplified and on one line including + *c*. Allow other simplified equivalent terms such eg. $-\frac{4}{\sqrt{x}}$ for $-4x^{-\frac{1}{2}}$ or e.g. $\frac{3}{x}$ for $3x^{-1}$ but do not allow e.g. $+-4x^{-\frac{1}{2}}$ or $-\frac{4}{1}x^{-\frac{1}{2}}$

Award once a correct expression is seen and isw but if there is any additional/incorrect notation and no correct expression has been seen on its own, withhold the final mark.

e.g. $\int -4x^{-\frac{1}{2}} + 3x^{-1} + c\,\mathrm{d}x$ or $-4x^{-\frac{1}{2}} + 3x^{-1} + c = 0$ with no correct expression seen earlier are both A0. Ignore $y = ...$

Alternative method: integration by parts

e.g. $\int \frac{2\sqrt{x}-3}{x^2}\,\mathrm{d}x = \int (2\sqrt{x}-3)x^{-2}\,\mathrm{d}x = -(2x^{\frac{1}{2}}-3)x^{-1} + \int x^{-\frac{3}{2}}\,\mathrm{d}x$

$-(2x^{\frac{1}{2}}-3)x^{-1} + \int x^{-\frac{3}{2}}\,\mathrm{d}x = -2x^{-\frac{1}{2}} + 3x^{-1} - 2x^{-\frac{1}{2}} + c = -4x^{-\frac{1}{2}} + 3x^{-1} + c$

M1: For attempting integration by parts and achieving the correct structure for the intermediate stage

e.g. $\pm(...x^{\frac{1}{2}}\pm...)x^{-1}\pm\int x^{-\frac{3}{2}}\,\mathrm{d}x$ or equivalent. Indices do not need to be processed

e.g. $x^{-2}\left(...x^{\frac{3}{2}}\pm...x\right)\pm\int...x^{-3}\left(...x^{\frac{3}{2}}\pm...x\right)\mathrm{d}x$

A1: $-(2x^{\frac{1}{2}}-3)x^{-1}+\int x^{-\frac{3}{2}}\,\mathrm{d}x$ or $x^{-2}\left(\frac{4}{3}x^{\frac{3}{2}}-3x\right)-\int-2x^{-3}\left(\frac{4}{3}x^{\frac{3}{2}}-3x\right)\mathrm{d}x$ o.e.

dM1: For completing the integration by parts method achieving at least one term with a correct index (the index does not need to be processed) and terms with the same index do not need to be collected for this mark

A1: As above in the main scheme (see notes)