6.

$$\int 2x^5 - 6x^{\frac{1}{2}} \, dx$$

$$= \frac{2x^6}{6} - \frac{6x^{3/2}}{\frac{3}{2}} + c$$

$$= \frac{x^6}{3} - 4x^{3/2} + c$$

Question	Generic scheme	Illustrative scheme	Max mark
6.	$\bullet^1$ express second term in integrable form	$\bullet^1$ $\ldots - 6x^{\frac{1}{2}}$	**4**
	$\bullet^2$ integrate one term	$\bullet^2$ $\frac{2}{6}x^6 \ldots$ or $\ldots - \frac{6x^{\frac{3}{2}}}{\frac{3}{2}}$	
	$\bullet^3$ integrate other term	$\bullet^3$ $\ldots - \frac{6x^{\frac{3}{2}}}{\frac{3}{2}}$ or $\frac{2}{6}x^6 \ldots$	
	$\bullet^4$ complete integration	$\bullet^4$ $\frac{1}{3}x^6 - 4x^{\frac{3}{2}} + c$	

Notes:

1. The mark for integrating the final term is only available if candidates integrate a term with a fractional index.
2. Do not penalise the appearance of an integral sign and/or dx throughout.
3. Do not penalise the omission of '$+c$' at $\bullet^2$ or $\bullet^3$.
4. All coefficients must be simplified at $\bullet^4$ stage for $\bullet^4$ to be awarded.
5. Accept $\frac{x^6 - 12x^{\frac{3}{2}}}{3} + c$ for $\bullet^4$ but do not accept $\frac{2x^6 - 24x^{\frac{3}{2}}}{6} + c$.
6. $\bullet^2$, $\bullet^3$ and $\bullet^4$ are not available within an invalid strategy.

Commonly Observed Responses:

Candidate A

$\int \left(2x^5 - 6x^{\frac{1}{2}}\right) dx$ $\bullet^1$ ✓

$= \frac{2x^6}{6} - \frac{6x^{\frac{3}{2}}}{\frac{3}{2}} + c$ $\bullet^2$ ✓ $\bullet^3$ ✓

$= \frac{2x^6}{6} - 4x^{\frac{3}{2}} + c$

$= \frac{1}{3}x^6 - 4\sqrt{x} + c$ $\bullet^4$ ×

$\bullet^4$ cannot be awarded over two lines of working

Candidate B - integrating over two lines

$\frac{2x^6}{6} - 6x^{\frac{1}{2}}$ $\bullet^1$ ✓

$= \frac{2x^6}{6} - \frac{6x^{\frac{3}{2}}}{\frac{3}{2}} + c$ $\bullet^2$ ✓ $\bullet^3$ ×

$= \frac{1}{3}x^6 - 4x^{\frac{3}{2}} + c$ $\bullet^4$ ✓1

Candidate C - insufficient evidence

$\int 2x^5 - 6x^{\frac{1}{2}} dx$ $\bullet^1$ ✓

$\frac{1}{3}x^6 - 9x^{\frac{3}{2}} + c$ $\bullet^2$ ✓ $\bullet^3$ ^ $\bullet^4$ ×

Candidate D

⋮ $\bullet^1$ ✓

$= \frac{1}{3}x^6 - 4x^{\frac{3}{2}}$ $\bullet^2$ ✓ $\bullet^3$ ✓

$= \frac{1}{3}x^6 - 4\sqrt{x^3} + c$ $\bullet^4$ ✓