Question Number	Scheme	Marks
1	$x^n \to x^{n+1}$ $\int\left(8x^3-6\sqrt{x}-\frac{2}{5x^3}\right)\mathrm{d}x = 2x^4-4x^{\frac{3}{2}}+\frac{1}{5x^2}+c$	M1 A1A1A1
		(4 marks)

M1 Increases the power by one on one of the terms in x

Must be for any one of $x^3 \to x^4$ $x^{\frac{1}{2}} \to x^{\frac{3}{2}}$ $x^{-3} \to x^{-2}$. Indices do not need to be processed for this mark. e.g. $x^3 \to x^{3+1}$ is fine.

A1 One term of $2x^4-4x^{\frac{3}{2}}+\frac{1}{5x^2}$ (may be unsimplified but indices must be processed)

A1 Any two terms of $2x^4-4x^{\frac{3}{2}}+\frac{1}{5x^2}$ (may be unsimplified but indices must be processed). Terms may appear as a list or be on different lines.

A1 $2x^4-4x^{\frac{3}{2}}+\frac{1}{5x^2}+c$ or simplified equivalent (including the constant of integration) all on one line.

e.g. accept $2x^4-4\left(\sqrt{x}\right)^3+0.2x^{-2}+c$ but do not accept $\frac{0.2}{x^2}$ or $\frac{\frac{1}{5}}{x^2}$ for $\frac{1}{5x^2}$

isw once a correct answer is seen but withhold if there is any spurious notation e.g. an integral sign or dx

Question Number	Scheme	Marks
2(a)	Gradient $= \dfrac{8-5}{7\sqrt{3}-\left(-2\sqrt{3}\right)}$ o.e.	M1
	e.g. $\Rightarrow \dfrac{3}{9\sqrt{3}} \times \dfrac{\sqrt{3}}{\sqrt{3}} = \dfrac{\sqrt{3}}{9}$	A1
		(2)
(b)	$\dfrac{1}{9}\sqrt{3} \rightarrow -\dfrac{9}{\sqrt{3}}$	B1ft
	$y-5 = "-\dfrac{9}{\sqrt{3}}"\left(x+2\sqrt{3}\right)$	M1
	$y = -3\sqrt{3}x - 13$	A1
		(3)
		(5 marks)

(a) Note $\dfrac{1}{9}\sqrt{3}$ with no working seen is M0A0

M1 Finds a correct expression for the gradient between *A* and *B* **which must not be of the form** $p\sqrt{3}$ where *p* is a rational constant e.g. $\dfrac{3}{9\sqrt{3}}$

We are not allowing sign slips when substituting in the coordinates for this mark. May subtract the other way round which is fine as long as it is consistent i.e. $\dfrac{5-8}{-2\sqrt{3}-7\sqrt{3}}$

Allow any version of the final answer which is not of the form $p\sqrt{3}$ where *p* is a rational constant to score.

May alternatively form two simultaneous equations ($5 = -2\sqrt{3}m + c$ and $8 = 7\sqrt{3}m + c$) and proceed to e.g. $\dfrac{8-5}{7\sqrt{3}-\left(-2\sqrt{3}\right)}$ or e.g. $\dfrac{3}{9\sqrt{3}}$ which must not be of the form $p\sqrt{3}$ where *p* is a rational constant.

Note working leading to e.g. $3 = m \times 9\sqrt{3} \Rightarrow m = \dfrac{\sqrt{3}}{9}$ is M0A0 (it is not of an allowable form before achieving the required answer)

A1 $p\sqrt{3}$ where *p* is a rational constant which does not have to be simplified e.g. $\dfrac{1}{9}\sqrt{3}$ or $\dfrac{\sqrt{3}}{9}$ or $\dfrac{3}{27}\sqrt{3}$ or $\dfrac{27}{243}\sqrt{3}$. It must come from a correct method and evidence of rationalising the denominator seen (they cannot just use their calculator)

Minimum working required e.g. $\dfrac{3}{9\sqrt{3}} \times \dfrac{\sqrt{3}}{\sqrt{3}} = \dfrac{\sqrt{3}}{9}$ or e.g. $\dfrac{3}{9\sqrt{3}} = \dfrac{3\sqrt{3}}{27}\left(= \dfrac{\sqrt{3}}{9}\right)$ is M1A1

Allow e.g. $\dfrac{3}{9\sqrt{3}} = \dfrac{1}{3\sqrt{3}} = \dfrac{\sqrt{3}}{9}$ to score M1A1 (cancelling first before rationalising)