1 Find $\int 7x^{\frac{5}{2}}\mathrm{d}x$. **[3]**

2 The gradient of a curve is given by $\frac{\mathrm{d}y}{\mathrm{d}x} = \frac{18}{x^3} + 2$. The curve passes through the point $(3, 6)$. Find the equation of the curve. **[5]**

3 The gradient of a curve is given by $\frac{\mathrm{d}y}{\mathrm{d}x} = 6x^{\frac{1}{2}} - 5$. Given also that the curve passes through the point (4, 20), find the equation of the curve. **[5]**

4 Find $\int_2^5 (2x^3 + 3)\,\mathrm{d}x$. **[3]**

5 The gradient of a curve is given by $\frac{\mathrm{d}y}{\mathrm{d}x} = 6\sqrt{x} - 2$. Given also that the curve passes through the point (9, 4), find the equation of the curve. **[5]**

6 Find $\int_2^5 \left(1 - \frac{6}{x^3}\right)\mathrm{d}x$. **[4]**

7 Find $\int_1^2 (12x^5 + 5)\,\mathrm{d}x$. **[4]**

8 The gradient of a curve is $3\sqrt{x} - 5$. The curve passes through the point (4, 6). Find the equation of the curve. **[5]**

9 A curve has gradient given by $\frac{dy}{dx} = 6\sqrt{x}$. Find the equation of the curve, given that it passes through the point (9, 105). [4]

10 Find $\int_1^2 \left(x^4 \quad \frac{3}{x^2} + 1 \right) dx$, showing your working. [5]

11 Find $\int 30x^{\frac{3}{2}} dx$. **[3]**

12 Find $\int (x^5 + 10x^{\frac{3}{2}}) dx$. **[4]**