

1 Integrate with respect to  $x$

**a**  $(x-2)^7$       **b**  $(2x+5)^3$       **c**  $6(1+3x)^4$       **d**  $(\frac{1}{4}x-2)^5$   
**e**  $(8-5x)^4$       **f**  $\frac{1}{(x+7)^2}$       **g**  $\frac{8}{(4x-3)^5}$       **h**  $\frac{1}{2(5-3x)^3}$

2 Find

**a**  $\int (3+t)^{\frac{3}{2}} dt$       **b**  $\int \sqrt{4x-1} dx$       **c**  $\int \frac{1}{2y+1} dy$   
**d**  $\int e^{2x-3} dx$       **e**  $\int \frac{3}{2-7r} dr$       **f**  $\int \sqrt[3]{5t-2} dt$   
**g**  $\int \frac{1}{\sqrt{6-y}} dy$       **h**  $\int 5e^{7-3t} dt$       **i**  $\int \frac{4}{3u+1} du$

3 Given  $f'(x)$  and a point on the curve  $y = f(x)$ , find an expression for  $f(x)$  in each case.

**a**  $f'(x) = 8(2x-3)^3$ ,  $(2, 6)$       **b**  $f'(x) = 6e^{2x+4}$ ,  $(-2, 1)$   
**c**  $f'(x) = 2 - \frac{8}{4x-1}$ ,  $(\frac{1}{2}, 4)$       **d**  $f'(x) = 8x - \frac{3}{(3x-2)^2}$ ,  $(-1, 3)$

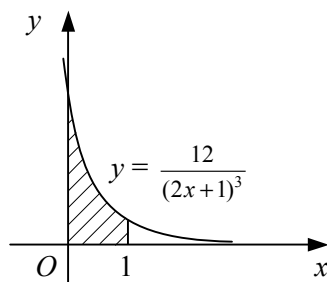
4 Evaluate

**a**  $\int_0^1 (3x+1)^2 dx$       **b**  $\int_1^2 (2x-1)^3 dx$       **c**  $\int_2^4 \frac{1}{(5-x)^2} dx$   
**d**  $\int_{-1}^1 e^{2x+2} dx$       **e**  $\int_2^6 \sqrt{3x-2} dx$       **f**  $\int_1^2 \frac{4}{6x-3} dx$   
**g**  $\int_0^1 \frac{1}{\sqrt[3]{7x+1}} dx$       **h**  $\int_{-7}^{-1} \frac{1}{5x+3} dx$       **i**  $\int_4^7 \left(\frac{x-4}{2}\right)^3 dx$

5 Find the exact area of the region enclosed by the given curve, the  $x$ -axis and the given ordinates. In each case,  $y > 0$  over the interval being considered.

**a**  $y = e^{3-x}$ ,  $x = 3$ ,  $x = 4$       **b**  $y = (3x-5)^3$ ,  $x = 2$ ,  $x = 3$   
**c**  $y = \frac{3}{4x+2}$ ,  $x = 1$ ,  $x = 4$       **d**  $y = \frac{1}{(1-2x)^2}$ ,  $x = -2$ ,  $x = 0$

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The diagram shows part of the curve with equation  $y = \frac{12}{(2x+1)^3}$ .

Find the area of the shaded region bounded by the curve, the coordinate axes and the line  $x = 1$ .