INTEGRATION

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** $\dfrac{1}{(x+7)^2}$ **g** $\dfrac{8}{(4x-3)^5}$ **h** $\dfrac{1}{2(5-3x)^3}$

2 Find

a $\int (3+t)^{\frac{3}{2}}\ dt$ **b** $\int \sqrt{4x-1}\ dx$ **c** $\int \dfrac{1}{2y+1}\ dy$

d $\int e^{2x-3}\ dx$ **e** $\int \dfrac{3}{2-7r}\ dr$ **f** $\int \sqrt[3]{5t-2}\ dt$

g $\int \dfrac{1}{\sqrt{6-y}}\ dy$ **h** $\int 5e^{7-3t}\ dt$ **i** $\int \dfrac{4}{3u+1}\ du$

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 $f'(x) = 2 - \dfrac{8}{4x-1}$, $(\frac{1}{2}, 4)$ **d** $f'(x) = 8x - \dfrac{3}{(3x-2)^2}$, $(-1, 3)$

4 Evaluate

a $\int_0^1 (3x+1)^2\ dx$ **b** $\int_1^2 (2x-1)^3\ dx$ **c** $\int_2^4 \dfrac{1}{(5-x)^2}\ dx$

d $\int_{-1}^1 e^{2x+2}\ dx$ **e** $\int_2^6 \sqrt{3x-2}\ dx$ **f** $\int_1^2 \dfrac{4}{6x-3}\ dx$

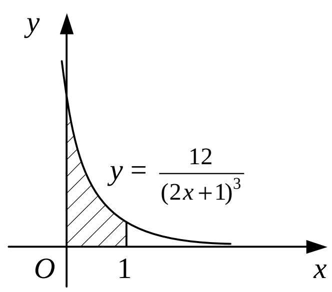
g $\int_0^1 \dfrac{1}{\sqrt[3]{7x+1}}\ dx$ **h** $\int_{-7}^{-1} \dfrac{1}{5x+3}\ dx$ **i** $\int_4^7 \left(\dfrac{x-4}{2}\right)^3\ dx$

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 $y = \dfrac{3}{4x+2}$, $x = 1$, $x = 4$ **d** $y = \dfrac{1}{(1-2x)^2}$, $x = -2$, $x = 0$

6



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

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