INTEGRATION (Q 8, PAPER 1)

2006

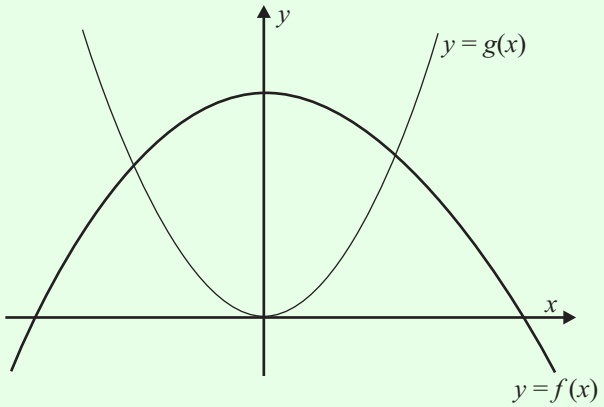
8 (a) Find (i) $\int \sqrt{x}\,dx$ (ii) $\int e^{-2x}\,dx$.

8 (b) Evaluate (i) $\int_1^2 x(1+x^2)^3\,dx$ (ii) $\int_0^{\frac{\pi}{4}} \sin 5\theta \cos 3\theta\,d\theta$.

8 (c) The diagram shows the graphs of the curves $y = f(x)$ and $y = g(x)$, where $f(x) = 12 - 3x^2$ and $g(x) = 9x^2$.

(i) Calculate the area of the region enclosed by the curve $y = f(x)$ and the x-axis.

(ii) Show that the region enclosed by the curves $y = f(x)$ and $y = g(x)$ has half that area.



ANSWERS

8 (a) (i) $\frac{2}{3}x^{\frac{3}{2}} + c$ (ii) $-\frac{1}{2}e^{-2x} + c$

8 (b) (i) $\frac{609}{8}$ (ii) $\frac{1}{4}$

8 (c) (i) 32