INTEGRATION (Q 8, PAPER 1)

2003

8 (a) Find (i) $\int (x^3 + 2)\,dx$ (ii) $\int e^{7x}\,dx$.

8 (b) (i) Evaluate $\int_0^1 \frac{2x}{\sqrt{1+x^2}}\,dx$

(ii) By letting $u = \sin x$, evaluate $\int_0^{\frac{\pi}{2}} \cos x \sin^6 x\,dx$.

8 (c) (i) Show that $\int_a^{2a} \sin 2x\,dx = \sin 3a \sin a$.

(ii) Use integration methods to show that the volume of a sphere with radius r is $\frac{4}{3}\pi r^3$.

ANSWERS

8 (a) (i) $\frac{1}{4}x^4 + 2x + c$ (ii) $\frac{1}{7}e^{7x} + c$

8 (b) (i) $2(\sqrt{2} - 1)$ (ii) $\frac{1}{7}$