

INTEGRATION (Q 8, PAPER 1)

1997

8 (a) Find (i) $\int \sin 4x \, dx$ (ii) $\int (1 + \sqrt{x})^2 \, dx$.

(b) Evaluate (i) $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} 2 \cos^2 3\theta \, d\theta$ (ii) $\int_0^1 \frac{x^2}{x+1} \, dx$.

(c) Calculate the value of

$$\int_{\frac{1}{3}}^3 \frac{1}{t + \sqrt{t}} \, dt.$$

Hint: $u = \sqrt{t}$.

ANSWERS

8 (a) (i) $-\frac{1}{4} \cos 4x + c$ (ii) $x + \frac{1}{2}x^2 + \frac{4}{3}x^{\frac{3}{2}} + c$

(b) (i) π (ii) $\ln 2 - \frac{1}{2}$

(c) $\ln 3$