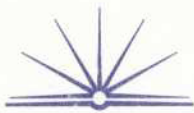


3a.

$$\int_0^1 \frac{dx}{x+4}$$

=



3 b.

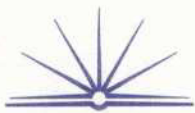
$$S = kM^{\frac{2}{3}}$$

$$18600 = k \times 70^{\frac{2}{3}}$$

$$k = 263 \frac{11}{53}$$

$$S = 263 \frac{11}{53} \times 60^{\frac{2}{3}}$$

$$= 15968 \text{ (5 sig fig)}$$



3ci. let $y = \ln(x^2 - 9)$

$$u = \ln \quad u' = \frac{1}{x}$$

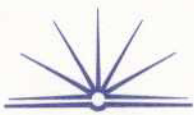
$$y' = uv' + vu'$$

$$v = x^2 + 9 \quad v' = 2x$$

$$= \ln \times 2x + (x^2 + 9) \times \frac{1}{x}$$

$$= 2\ln x + x + \frac{9}{x}$$

$$= 2\ln x + 9$$



3c.ii.

~~let~~

$$\text{let } y = \frac{x}{e^x}$$

$$y' = \frac{vu' - uv'}{v^2}$$

$$u = x \quad u' = 1$$

$$v = e^x \quad v' = e^x$$

$$= \frac{e^x \times 1 - x \times e^x}{(e^x)^2}$$

$$= \frac{e^x - xe^x}{(e^x)^2}$$

$$= \frac{e^x - x}{e^x}$$

$$= -x$$

3d. $c^2 = a^2 + b^2 - 2ab \cos C$