

Question 3

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

$$= \frac{1}{2} \left[\ln(x+4) \right]_0^1$$

$$= \frac{1}{2} \left[\ln(1+4) \right] - \left[\ln(0+4) \right]$$

$$= \frac{1}{2} \left[1.609 - 1.386294 \right]$$

$$= 0.11$$

b) $S = km^{\frac{1}{4}}$

$$m = 70 \text{ kg}$$

$$S = 18,600$$

$$18600 = k \times 70^{\frac{1}{4}}$$

$$18600 = k \times 16.98$$

$$k = 1095.08$$

c) $u = \ln(x^2 - 9)$

$$= uv' + vu'$$

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

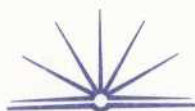
$$= \ln(x^2 - 9) \cdot 2x + 1$$

ii) $\frac{x}{e^x}$

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

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

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



$$d) a^2 = b^2 + c^2 - 2bc \cos A$$

$$13^2 = x^2 + 7^2 - 2 \cdot x \cdot 7 \cos 60$$

$$13^2 = x^2 + 49 - 14x \cos 60$$

~~x~~

$$169 = x^2 + 49$$

$$120 = x^2 - 14x \cos 60$$

$$120 - \cos 60 = x^2 - 14x$$

$$-x^2 + 120 = \cos 60 - 14x$$

$$= \frac{1}{2} - 14x$$

$$-x^2 + 120 = -7x$$

$$\cos 60 = \frac{1}{2}$$

$$120 = x^2 - 7x$$

$$120 = -7x + x^2$$

$$x^2 - 7x = 120$$