



$$\begin{aligned} \textcircled{3} \text{ a) } \int_0^5 \frac{1}{x+4} dx &= [\ln(x+4)]_0^5 \\ &= \ln 5 - \ln 4 \\ &= \ln \frac{5}{4} \\ &= 0.223143551 \dots \\ &= 0.22 \quad (2 \text{ dp}) \end{aligned}$$

$$\text{b) } S = kM^{2/3}$$

$$M = 70 \text{ kg}, \quad S = 18\,600 \text{ cm}^2$$

$$18\,600 = k(70)^{2/3}$$

$$k = \frac{18\,600}{(70)^{2/3}}$$

$$k = \underline{1095.08438 \dots}$$

$$M = 60$$

$$S = kM^{2/3}$$

$$S = k(60)^{2/3}$$

$$= 16\,783.46979$$

$$= \underline{16\,783.47 \text{ cm}^2} \quad (2 \text{ dp})$$



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

$$y' = \frac{1}{(x^2 - 9)} \times 2x$$

$$= \frac{2x}{x^2 - 9}$$

$$y' = \frac{2x}{(x-3)(x+3)}$$

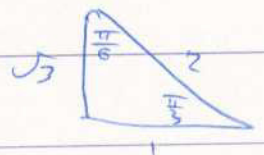
$$ii) y = \frac{x}{e^x}$$

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

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

$$= \frac{1 - x}{e^x}$$

$$= \frac{1 - x}{e^x}$$



$$d) \quad 13^2 = x^2 + 7^2 - 2(x)(7) \cos 60$$

$$169 = x^2 + 49 - 14x \left(\frac{1}{2}\right)$$

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

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