2002/2003
MATHS 122
Test I

Question 1:

Set up the integral (do not evaluate) that can be used to find the volume of the solid resulting from revolving the region bounded by

$$y = x^2 + 1 \quad \text{and} \quad y = 2x + 4$$

about

(a) $x - axis$
(b) $x = -4$

Question 2:

Set up the integral (do not evaluate) that can be use to find the area of the region bounded by

$$y = \cosh x \quad , \quad y = \sinh x \quad , \quad y = 2 \quad , \quad x = 0$$

Question 3:

Find the limit if it exists

(a) $\lim_{x \to 0} \dfrac{x - \sin^{-1} x}{x - \sin x}$

(b) $\lim_{x \to \infty} \left(1 + \dfrac{1}{x^2}\right)^{x^2}$

Question 4:

Evaluate

(a) $\int x^5 \sqrt{1 + x^3} \, dx$

(b) $\int \dfrac{\sinh x}{\sqrt{4 + \sinh^2 x}} \, dx$