Question 1

Set up the integrals **(Do not evaluate)** that can be used to find the area of the region bounded by :

$$y = x - 1, \quad y = 3 - x, \quad y = 0$$

Question 2

Set up the integrals **(Do not evaluate)** that can be used to find the volume of the solid resulting from resolving the region bounded by:

$$y = x^2 + 1 \text{ and } y = 5 - x^2$$

about

a)   x-axia   b) $y = 6$ c) $x = -3$

Question 3

Find the limit if it exists

1.   (I) $\displaystyle\lim_{x \to 0^+} x^{\tan x}$ (II) $\displaystyle\lim_{x \to 0} \frac{e^{2x} - e^{-2x} - 4x}{x^2}$

2.   Find the derivative of $\sec h^{-1}(\tanh x)$ and show it is equal to $-\csc h\, x$

3.   Evaluate: $\displaystyle\int \frac{\cosh x}{\sqrt{\cos h^2 x + \sin h^2 x}}\, dx$