1. (10 points) Set up, but do not evaluate, integrals which represent each of the following quantities.

(a) The average value of the function \( g(x) = x + \sin(x) \) over the interval \( \left[ \frac{\pi}{4}, \frac{\pi}{2} \right] \).

(b) The length of the curve \( f(x) = \ln x \) from \( x = 2 \) to \( x = 100 \).

(c) The area of the surface generated by revolving the portion of the curve \( y = \sqrt{25 - x^2} \) between \( x = -2 \) and \( x = 3 \) about the \( x \)-axis.