1. (5 pts) Using the method of cylindrical shells, find the volume of the solid obtained by rotating the region enclosed by the curves
   \[ y = 1 - x^2, \quad \text{and} \quad y = -(1 + x) \]
   about the line \( x = 3 \).

2. (5 pts) Find the average value of the function
   \[ f(x) = x \sec(2x) \]
   on the interval \( [0, \frac{\pi}{8}] \).