1.) Find the average value of the function over the given interval.
   
   a.) \( y = \sin x \) for \( x = 0 \) to \( x = \pi \)
   
   b.) \( y = \cos x \) for \( x = 0 \) to \( x = 2\pi \)
   
   c.) \( y = \sec^2 2x \) for \( x = 0 \) to \( x = \pi/6 \)

2.) Find the area of the region lying between the graphs of
   
   a.) \( y = \sin x \) and \( y = 1/2 \) on the interval \([0, \pi]\).
   
   b.) \( y = \sin x \) and \( y = \cos x \) on the interval \([\pi/4, 5\pi/4]\).

3.) Find the area of the region bounded by the graphs of
   
   a.) \( x = y^2 \) and \( x = 9 \).
   
   b.) \( x = y^2 \) and \( x = y + 2 \).
   
   c.) \( x = y (y-2) \) and \( x = y (1-2y) \).