1) Find the following limits
   a) \[ \lim_{x \to 0} \frac{1 - \cos x}{x^2} = \frac{\sin x}{2x} \lim_{x \to 0} \frac{\cos x}{x} = \frac{1}{2} \]
   b) \[ \lim_{x \to 0} \left(1 + \frac{5}{x}\right)^x = e^5 \quad (as \ discussed \ in \ recitation) \]

2) Write down the iterative formula for Newton's Method and set up a scheme to find zeros of
   \[ f(x) = \sin(x) \]
   Formula: \[ x_{n+1} = x_n - \frac{f(x)}{f'(x)} \]
   Scheme: \[ x_{n+1} = x_n - \frac{\sin(x_n)}{\cos(x_n)} = x_n - \tan(x_n) \]

3) Find the area of the region bounded by \( y = x^2 \) and \( y = x^3 \) in the first quadrant.
   \[ \int_0^1 (x^3 - x^2) \, dx = \frac{1}{3} x^3 - \frac{1}{4} x^4 \bigg|_0^1 = \frac{1}{3} - \frac{1}{4} = \frac{1}{12} \]