Worksheet 7.5

1. Approximate using differentials: \( f(x + dx) = f(x) + f'(x)dx \)
   
   (a) \( \sqrt{26} \)  
   (b) \( \sqrt{24} \)  
   (c) \( \sqrt[3]{9} \)  
   (d) \( \sqrt[3]{7} \)

2. Find the series for \( (1 + x)^{3/5} \) when \( |x| < 1 \). Use it to approximate \( (1.5)^{0.4} \).

3. Estimate \( e \) and \( e^2 \) using series.

4. Approximate \( \cos(0.1) \) and \( \cosh(0.1) \).

5. Find a function with
   
   (a) \( f(0) = 7 \quad f'(0) = 5 \quad f''(0) = -2 \)
   (b) \( f(0) = -1 \quad f'(0) = 0 \quad f''(0) = 4 \)
   (c) \( f(1) = 0 \quad f'(1) = 2 \quad f''(1) = 1 \)
   (d) \( f(2) = 1 \quad f'(2) = -1 \quad f''(2) = 5 \)