

Review Problems for Test 3

1. Find the Taylor polynomial of degree n at $x_0 = 0$ for the function

$$f(x) = xe^x, \quad n = 4.$$

Use this approximation to find $f(\frac{1}{4})$.

2. Find the n -th Taylor polynomial centered at c .

$$f(x) = \sqrt{x}, \quad n = 4, \quad c = 4.$$

3. Use the Lagrange remainder formula to determine the accuracy of the approximation

$$e \approx 1 + 1 + \frac{1^2}{2!} + \frac{1^3}{3!} + \frac{1^4}{4!} + \frac{1^5}{5!}.$$

4. Determine the degree of the Maclaurin polynomial required for the error in the approximation of the function at the indicated value of x to be less than 0.001.

$$e^{0.75}$$

5. Find the Maclaurin series for the function

$$f(x) = \frac{e^x + e^{-x}}{3} = \cosh x.$$

6. Use the binomial series to find the MacLaurin series of the function

$$f(x) = \sqrt{1+x}.$$