Recitation 2

1a. $e^x \approx 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} = 1 + x + \frac{x^2}{2} + \frac{x^3}{6} + \frac{x^4}{24}$

b. x = 1: $e \approx 2.7083$ error = .366%

x = 2: $e \approx 6$ error = 5.27%

2a. $\sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!}$

b & c. $\cos x = 1 - \frac{x^2}{2!} + \frac{x^4}{4!}$ $\cos\left(\frac{\pi}{4}\right) = 1 - \frac{\left(\frac{\pi}{4}\right)^2}{2} + \frac{\left(\frac{\pi}{4}\right)^4}{24} =$ 0.7074292066 error is 0.0455978%.

d. sinx = $\sum_{n=1}^{\infty} (-1)^{n+1} \frac{x^{2n-1}}{(2n-1)!}$ cosx = $\sum_{n=0}^{\infty} (-1)^{n+1} \frac{x^{2n}}{(2n)!}$

3. $\frac{1}{1-x} \approx 1 + x + x^2 + x^3 + x^4$.