MATH 1552, Integral Calculus

Sections 10.8-10.9: Taylor Polynomials

1. Find the third degree Taylor polynomial of the function $f(x) = \tan^{-1}(x)$ in powers of $x - 1$.

2. Use a Taylor polynomial to estimate the value of $\sqrt{e}$ with an error of at most 0.01. HINT: Choose $a = 0$ and use the fact that $e < 3$.

3. For what values of x can we replace $\cos x$ with $1 - \frac{x^2}{2!} + \frac{x^4}{4!}$ within an error range of no more that 0.001?