Math 143 Set 2

1. Find the degree 5 Taylor polynomial for:

a. $\cos x$ at $x = 0$.

b. $1 - 3x^2 + 2x^3 + x^7 + 4x^{10}$ at $x = 0$.

c. $(x-1)^2 + (x-1)^3 + (x-1)^{1000}$ at $x = 1$.

d. $\dfrac{1}{\sqrt{1-x}}$ at $x = 0$.

e. $(1+x)^\pi$ at $x = -1$.

f. $\sin(4x)$ at $x = \pi/2$.

g. e^{ax} at $x = 0$ where a is any number.

h. $(1-x)^{-3}$ at $x = 0$.

2. Find the degree 5 Taylor for $\sqrt{1+x}$ at $x = 0$. This polynomial is the best degree 5 approximation for $\sqrt{1+x}$ at $x = 0$. Evaluate your polynomial at $x = 1$ to approximate the value of $\sqrt{1+1} = \sqrt{2}$. Use a calculator to determine the (absolute) error in using this approximation.

3. Find the degree n Taylor polynomial for $\arctan x$ at $x = 0$.