Numerical Analysis
Homework 3

1. Programming: Use the Bisection Method to find the root of the following equation to six correct decimal places:
   (a) $3x^3 + x^2 = x + 5$
   (b) $\cos^2 x + 6 = x$
2. Use Secants Method in the previous exercise instead of Bisection method.
3. Find all fixed points of the following $g(x)$
   (a) $\frac{x+6}{3x-2}$
   (b) x^5
4. Programming: Apply Fixed-Point Iteration to find the solution of each equation to eight correct decimal places:
   (a) $x^5 + x = 1$
   (b) $\sin x = 6x + 5$
   (c) $\ln x + x^2 = 3$
5. Programming: In the previous exercise apply Newton's Method instead of Fixed-Point Iteration to approximate the root to eight correct decimal places
6. Prove that Newton's Method applied to $f(x) = ax + b$ converges in one step.
7. Suppose Newton's Method is applied to the function $f(x) = 1/x$. If the initial guess is $x_0 = 1$, find x_{50}.