

Section 2.3

1. Newton's Method

```
function [ iter ] = mynewton1(f, df,x0, tol,n)
%UNTITLED3 Summary of this function goes here--please write
% Detailed explanation goes here -please write
%
%
%
%
iter=0;
u=feval(f, x0);
%evaluate function f at x0
v=feval(df,x0);
err=abs(u/v);
% err can be set up differently. for example 1.
disp('-----')
disp('iter      x          f(x)      |xn+1-xn| ')
disp('-----')
fprintf('%2.0f  %12.6f %12.6f  %12.6f\n', iter, x0,u, v)
%you can modify fprintf and diplay more decimal points.
while (err>tol)&(iter<=n)&(v~=0)
    % ~= means not equal, equal is ==, two equal signs.
    x1=x0-u/v;
    err=abs(x1-x0);
    x0=x1;
    u=feval(f, x0);
    v=feval(df,x0);
    iter=iter+1;
fprintf('%2.0f  %12.10f  %12.10f %12.10f\n', iter,x0,u,err)
%you can modify fprintf and diplay more decimal points or less.
end
if(v==0)
    disp(' division by zero')
end
if (iter>n)
    disp(' Method failed to converge')
end

end
```

2. The Secant Method

```
function [ iter ] = mysecant1(f,x0,x1, tol,n)
%UNTITLED3 Summary of this function goes here--please write
% Detailed explanation goes here -please write
%
%
%
%
iter=0;
u=feval(f, x0);
v=feval(f,x1);
err=abs(x1-x0);
disp('-----')
disp('iter      xn          f(xn)      |xn+1-xn| ')
disp('-----')
fprintf('%2.0f  %12.6f  %12.6f\n', iter, x0,u)
fprintf('%2.0f  %12.6f %12.6f %12.6f\n', iter, x1, v, err)
%you can modify fprintf and diplay more decimal points.
while (err>tol)&(iter<=n)&((v-u)~=0)
    x=x1-v*(x1-x0)/(v-u);
    %see the formula for the secant line method.
    x0=x1;
    u=v;
    x1=x;
    v=feval(f,x1);
    err=abs(x1-x0);
    iter=iter+1;
    fprintf('%2.0f  %12.6f  %12.6f %12.6f\n', iter,x1,v,err)
    %you can modify fprintf and diplay more decimal points.
end
if((v-u)==0)
    disp(' division by zero')
end
if (iter>n)
    disp(' Method failed to converge')
end

end
```