Section 1.1 (Page 14-17): 1c (just for $[2, 3]$), 4c, 9ab

Section 2.1 (Page 54-56): 11a, 14. (For 14, you can find the approximation to the root by doing the computations with a calculator, or using *Matlab* modifying the Bisection code given on the next page).

Section 2.3 (Page 75-78): 12a. Write *Matlab* programs for the three methods based on the model program given on the next page. Print out the approximation given after each iteration and the total number of iterations required by each method. Note that for these methods, we will assume we have satisfied the given accuracy requirement if two successive iterates agree ti the given error tolerance, i.e., $|x_{n+1} - x_n| \leq 10^{-7}$.

```
% Bisection
% a = left end point of interval containing the root
% b = right  end point of interval containing the root
% tolx = error tolerance in x
% tolf = error tolerance in the function value
% N = the current iteration number
% Nmax = maximum number of iterations
% fcn.m is the name of the file containing the function
format long
a=1;
b=4;
N=1;
Nmax = 50;
tolx = .001;
tolf = 0.00000001;
fa = feval('fcn',a);
fb = feval('fcn',b);
m =(a+b)/2;
fm = feval('fcn',m);
while (abs(b-a) > tolx) & (abs(fm) > tolf) & (N < Nmax)
[N,a,b,m,fm]
 if fa*fm <=0;
  b = m;
  fb = fm;
 else a = m;
  fa= fm;
end
 m = (a+b)/2;
 fm = feval('fcn', m);
 N= N+1;
end
```

To use this program, first create a Matlab m-file with the name fcn.m. Note that such a file must have the extension .m and must be placed in the directory from which you are running Matlab. For example, for the function $f(x) = x - \cos x$, the contents of the file fcn.m would be:

```
function  f = fcn(x)
f = x - cos(x);
```

I would recommend making a separate bisection.m file with that file as well. Then you can run it by typing "bisection" into the command prompt. Alternatively, you can type the modified bisection code into the comand prompt.