Problem 03

Code:

```
clear all

format long

fplot = linspace(1,3,100);

f=@(x) cos(x)-sin(x);

xL=1;

xR=3;

r=.382;

T= 10^-7;

I=0;

for n=1:200

    xM1=xL+(xR-xL)*r;

    xM2=xL+(xR-xL)*(1-r);

    I=I+1;

    if f(xM1)<f(xM2);

        xR=xM2;

    else

        xL=xM1;

    end

    if(xR-xL)<T

        break

    end

end

disp((xR+xL)/2)

I

plot(fplot, f(fplot), '-');
```

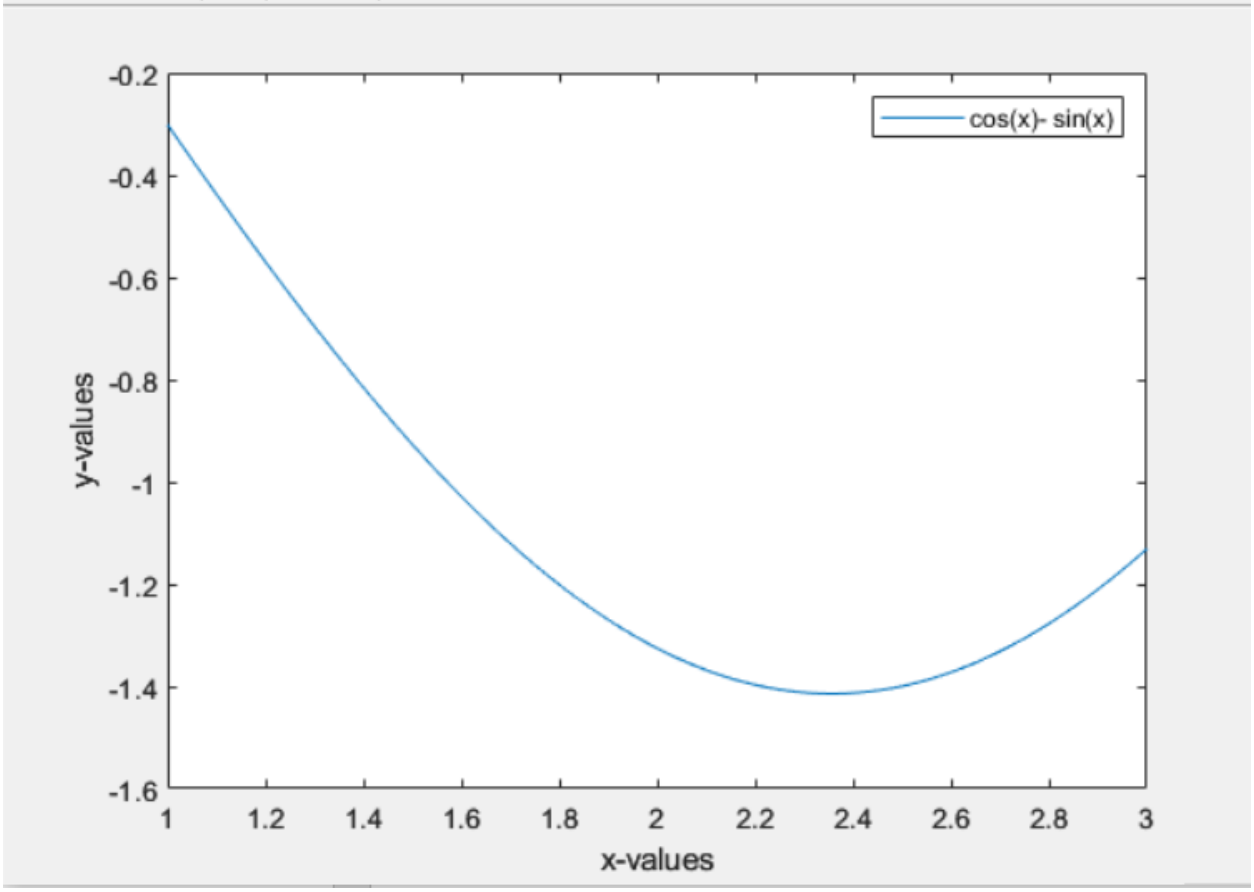
```
xlabel('x-values');

ylabel('y-values');

legend('cos(x)- sin(x)');
```

Output:
>> problem03
  2.356194479684493

I =

   35

Graph:



This is unimodal as it only has one minimum value.

Problem 04:

Code:

```
clear all

format long

fplot = linspace(1,3,100);

f=@(x) cos(x)-sin(x);

xL=1;

xR=3;

M=2;

T= 10^-7;

I=0;

for n=1:200

xm=M+.5*((f(xL)-f(M))*((xR-M)^2)-(f(xR)-f(M))*((M-xL)^2)/((f(xL)-f(M))*((xR-
M))+(f(xR)-f(M))*((M-xL))));



I=I+1;

    if f(xm)<f(M)

        xR=M;

    else

        xL=M;

    end

M=xm;

    if abs((xR)-(xL))<T

        break

    end

end

disp((xR+xL)/2)
```

```
disp("Number of Iteration:");
disp(I);
```

Output:

```
>> problem04
  2.356194530441244

Number of Iteration:
   20
```

Function is same as problem03 so, it is unimodal.