Problem2:

```
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%COSC 3340
%Spring 2023
%Homework2
%Problem2
%Last Modified: 02/13/2023
boolV = @(x) sum(1:x) > 100;
v = 1:50;
boolV(v)
```

Problem3:

```
bool = @(m,n, v) (m < sum(v)) && (sum(v) < n);
v = 1:10;
%This will return 1 or True as sum(v) < 1000 and sum(v) < 1000
disp('When m = 1000 and n = 100: ')
bool(1000,100,v)
%This will return 1 or True as sum(v) > 10 and sum(v) < 1000
disp('When m = 10 and n = 1000: ')
bool(10, 1000, v)
```

Problem4:

```
sumOfSeries = @(n) sum(1./(1:n));
%sum of the series from 1 to 1/100 is:
disp('Sum of the series from 1 to 1/100: ')
sumOfSeries(100)
```

Problem 5:

```
%Creating the function
pieceWise = @(x) (x+1).*(x<=0) + (sin(x)).*(x>0);
v = -20:20;
%Plotting the input values in the function.
plot(v, pieceWise(v), "Marker","+");
```

Problem6:

Filename : bisectionF.m

```
function[xRoot, fAtRoot, noOfIter] = bisectionF(xLin, xRin, alpha, maxIter, f)
xL(1)= xLin;
xR(1)= xRin;
for n = 1:maxIter
xM = (xL(n)+xR(n))/2;
fM= f(xM);
if abs(fM)<alpha
break
end
if f(xL(n))*fM <0
xL(n+1)= xL(n);
xR(n+1)= xM;
else
xR(n+1) = xR(n);
xL(n+1) = xM;
end
end
```

```
xRoot = xM;

fAtRoot = fM;

noOfIter = n;

end
```

ScriptBisection.m

```
format long;

%Actual code

f =@(x) (x.^3 + 3.*x+1)*(x>=0) + (1+sin(x))* (x>0);

xLin = -2.0;

xRin = 0.1;

alpha = 10^(-7);

nIter = 100;

[xRoot, fRoot, nIters] = bisectionF(xLin, xRin, alpha, nIter, f)
```

Output: outputBisection.txt

1. Value of root x* = -0.95

2.The value of f(x*) = 0

3.The number of iterations performed: 1

Problem 7:

Filename: newt_Rev.m

```
function [xRoot, fRoot, nIters] = newt_RevL(f, fd, xI, numIter, alpha)
x(1) = xI;
for i = 1: numIter
x(i+1) = x(i) - f(x(i))/ fd(x(i));
fval = f(x(i+1));
xval = x(i+1);
if abs(fval)< alpha
break
end
end
xRoot = xval;
fRoot = fval;
nIters = i;
```

Filename: scriptNewt_Rev.m

```
clear all;
format long;
f = @(x) x.^3 + 3.*x +1;
fd = @(x) 3*x.^2 +3;
[xRoot, fValue, numIters] = newt_RevL(f, fd, -2, 100, 10^(-6))
```

Output file: outputNewt_Rev.txt

1. Value of root x* = -0.322185361713641

2.The value of f(x*) = -2.346980232381668e-08

3.The number of iterations performed: 5