Practical - 1

Bisection Method:-

```
f[x_] = x^3 + 4 x^2 - 10;
a = 1;
b = 2;
ϵ = 0.01;
N_max = 5;
If[f[a] * f[b] > 0,
  Print["These values do not satisfy the IVP so change the initial value"],
  For[i = 1, i < N_max, i++, c = (a + b)/2;
   If[Abs[(b - a)/2] < ϵ, Return[c],
    Print[i, "th iteration value is:-  ", c]
     Print["Estimated  error is:-  ", i, "th iteration is:-  ", (b - a)/2];
    If[f[a] * f[c] < 0, b = c, a = c]]]];
Plot[f[x], {x, 1, 2}]
```

1th iteration value is:- $\frac{3}{2}$

Estimated error is:- 1th iteration is:- $\frac{1}{2}$

2th iteration value is:- $\frac{5}{4}$

Estimated error is:- 2th iteration is:- $\frac{1}{4}$

3th iteration value is:- $\frac{11}{8}$

Estimated error is:- 3th iteration is:- $\frac{1}{8}$

4th iteration value is:- $\frac{21}{16}$

Estimated error is:- 4th iteration is:- $\frac{1}{16}$