

NAME :

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MAT/21/60

Practical 3

Secant Method

AIM :- To perform the iterations of Secant Method for the functions within an absolute convergence of 5×10^{-7}

```
In[1]:= SecantMethod[x0_, x1_, max_] := Module[{}, k = 1; p0 = N[x0];
  p1 = N[x1];
  p2 = p1;
  p1 = p0;
  While[(k < max && Abs[f[p2]] > 0.0000005),
    p0 = p1;
    p1 = p2;
    p2 = p1 - (f[p1] (p1 - p0) / (f[p1] - f[p0]));
    k = k + 1;];
  Print["p", k, "=", NumberForm[p2, 11]];
  Print ["f p", k, " =", NumberForm[f p2, 11];
```

(i) $f[x] = x^3 - 2x - 5$ on the interval [1,2]

```
In[2]:= f[x_] := x^3 - 2 x x - 5
SecantMethod 1, 2, 50
p6=2.0945514814
f p6 =-2.0090498154 x 10^-9
In[4]:= Clear f, x, p
```

(ii) $f[x] = \text{Cos}[x] - x$ on the interval [0,1]

[] []

```
In[5]:= f x_ := Cos x - x  
        SecantMethod 0, 1, 20  
  
p5=0.73908511213  
  
f p5 =3.5292622824 x 10-8  
  
In[7]:= Clear f, x, p
```

(iii) $f[x] = \sin[x]$ on the interval $[3,4]$

```
In[8]:= f[x_] := Sin[x]  
        SecantMethod 3, 4, 30  
  
p4=3.141592728  
  
f p4 =-7.4395063765 x 10-8  
  
In[10]:= Clear f, x, p
```