**Experiment no: 03**

**Problem: 1(a)**

**Input:**

Defining Function:

function y=f(x)

y=x^3-2\*x-5;

end

Finding the Roots:

clear all

clc

a(1)=2;

b(1)=3;

Er=0.5\*1e-5;

for i=1:inf

c(i)=(a(i)\*f(b(i))-b(i)\*f(a(i)))/(f(b(i))-f(a(i)));

if f(c(i))\*f(a(i))>0

a(i+1)=c(i);

b(i+1)=b(i);

else

a(i+1)=a(i);

b(i+1)=c(i);

end

if abs(f(c(i)))<=Er

break

end

end

format long

disp(‘Number of iteration’)

disp(i);

disp(‘Root is’)

disp(c(i));

disp(‘Function of root’)

disp(f(c(i)));

**Output:**

Number of iteration

13

Root is

2.094551255072798

Function of root

-2.527725217582599e-006

**Problem: 1(b)**

**Input:**

Defining Function:

function y=f1(x)

y=x\*sin(x)+cos(x);

end

Finding the Roots:

clear all

clc

a(1)=1;

b(1)=2;

Er=0.5\*1e-5;

for i=1:inf

c(i)=(a(i)\*f1(b(i))-b(i)\*f1(a(i)))/(f1(b(i))-f1(a(i)));

if f1(c(i))\*f1(a(i))>0

a(i+1)=c(i);

b(i+1)=b(i);

else

a(i+1)=a(i);

b(i+1)=c(i);

end

if abs(f1(c(i)))<=Er

break

end

end

disp('Root is :')

disp(c(i));

disp('Function of root')

disp(f1(c(i)));

disp('iteration=');

disp(i);

**Output:**

Root is :

9.317866385748722

Function of root

7.045068470823424e-007

iteration=

11

**Problem: 1(c)**

**Input:**

Defining Function:

function y=f1(x)

y=exp(-x)-x;

end

Finding the Roots:

clear all

clc

a(1)=0;

b(1)=1;

Er=0.5\*1e-5;

for i=1:inf

c(i)=(a(i)\*f2(b(i))-b(i)\*f2(a(i)))/(f2(b(i))-f2(a(i)));

if f2(c(i))\*f2(a(i))>0

a(i+1)=c(i);

b(i+1)=b(i);

else

a(i+1)=a(i);

b(i+1)=c(i);

end

if abs(f2(c(i)))<=Er

break

end

end

disp('Root is :')

disp(c(i));

disp('Function of root')

disp(f1(c(i)));

disp('iteration=');

disp(i);

**Output:**

Root is :

0.567144060375103

Function of root

1.148122909548744

iteration=

6

**Problem: 4**

**Input:**

clear all

clc

p=[1 0 -2 -5];

a(1)=2;

b(1)=3;

Er=0.5\*1e-5;

for i=1:inf

c(i)=(a(i)\*polyval(p,(b(i)))-b(i)\*polyval(p,(a(i))))/(polyval(p,b(i))-(polyval(p,(a(i)))));

if polyval(p,(c(i)))\*polyval(p,(a(i)))>0

a(i+1)=c(i);

b(i+1)=b(i);

else

a(i+1)=a(i);

b(i+1)=c(i);

end

if abs(polyval(p,(c(i))))<=Er

break

end

end

format long

disp('Root is :')

disp(c(i));

disp('Function of root')

disp(f1(c(i)));

disp('iteration=');

disp(i);

**Output:**

Root is :

2.094551255072798

Function of root

1.313635813320643

Iteration=

13

**Problem: 2**

**Input:**

Defining Function:

function y=f(x)

y=x^3-2\*x-5;

end

Finding the Roots:

clear all

clc

a(1)=2;

b(1)=3;

Er=0.5\*1e-8;

for i=1:inf

c(i)=(a(i)\*f(b(i))-b(i)\*f(a(i)))/(f(b(i))-f(a(i)));

if f(c(i))\*f(a(i))>0

a(i+1)=c(i);

b(i+1)=b(i);

else

a(i+1)=a(i);

b(i+1)=c(i);

end

if abs(f(c(i)))<=Er

break

end

end

format long

disp('Number of iteration');

disp(i);

disp('Root is');

disp(c(i));

disp('Function of root');

disp(f(c(i)));

**Output:**

Number of iteration

20

Root is

2.094551481333884

Function of root

-2.326514980666161e-009

**Comments:**

When the relative error is comparatively low then the number of iteration is high.

Then the proximate result tends to the real result, which is more accurate than previous observation.