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# Roll No:1970

# Course Code:ICT-2106

Exercise 1:

1. number:

>> syms x;

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

a=2;

b=3;

error=0.00001;

fa = eval(subs(y,x,a));

fb = eval(subs(y,x,b));

if fa\*fb > 0

disp('Root does not exist between the range');

else

c = a - (a-b) \* fa/(fa-fb);

fc = eval(subs(y,x,c));

fprintf('\n\na\t\t\tb\t\t\tc\t\t\tf(c)\n');

while abs(fc)>error

fprintf('%f\t%f\t%f\t%f\n',a,b,c,fc);

if fa\*fc< 0

b =c;

fb = eval(subs(y,x,b));

else

a =c;

fa = eval(subs(y,x,a));

end

c = a - (a-b) \* fa/(fa-fb);

fc = eval(subs(y,x,c));

end

fprintf('\nRoot is: %f\n', c);

end

a b c f(c)

2.000000 3.000000 2.058824 -0.390800

2.058824 3.000000 2.081264 -0.147204

2.081264 3.000000 2.089639 -0.054677

2.089639 3.000000 2.092740 -0.020203

2.092740 3.000000 2.093884 -0.007451

2.093884 3.000000 2.094305 -0.002746

2.094305 3.000000 2.094461 -0.001012

2.094461 3.000000 2.094518 -0.000373

2.094518 3.000000 2.094539 -0.000137

2.094539 3.000000 2.094547 -0.000051

2.094547 3.000000 2.094550 -0.000019

Root is: 2.094551

1. number:

>> syms x;

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

a=1;

b=2;

error=.00001;

fa = eval(subs(y,x,a));

fb = eval(subs(y,x,b));

if fa\*fb > 0

disp('root does not exit');

else

c = a - (a-b) \* fa/(fa-fb);

fc = eval(subs(y,x,c));

fprintf('\n\na\t\t\tb\t\t\tc\t\t\tf(c)\n');

while abs(fc)>error

fprintf('%f\t%f\t%f\t%f\n',a,b,c,fc);

if fa\*fc< 0

b =c;

fb = eval(subs(y,x,b));

else

a =c;

fa = eval(subs(y,x,a));

end

c = a - (a-b) \* fa/(fa-fb);

fc = eval(subs(y,x,c));

end

fprintf('\nRoot is: %f\n', c);

end

root does not exit

C . number:

syms x;

y=x-exp(-x);

a=0;

b=1;

error=.00001;

fa = eval(subs(y,x,a));

fb = eval(subs(y,x,b));

if fa\*fb > 0

disp('root does not exit');

else

c = a - (a-b) \* fa/(fa-fb);

fc = eval(subs(y,x,c));

fprintf('\n\na\t\t\tb\t\t\tc\t\t\tf(c)\n');

while abs(fc)>error

fprintf('%f\t%f\t%f\t%f\n',a,b,c,fc);

if fa\*fc< 0

b =c;

fb = eval(subs(y,x,b));

else

a =c;

fa = eval(subs(y,x,a));

end

c = a - (a-b) \* fa/(fa-fb);

fc = eval(subs(y,x,c));

end

fprintf('\nRoot is: %f\n', c);

end

a b c f(c)

0.000000 1.000000 0.612700 0.070814

0.000000 0.612700 0.572181 0.007888

0.000000 0.572181 0.567703 0.000877

0.000000 0.567703 0.567206 0.000098

0.000000 0.567206 0.567150 0.000011

Root is: 0.567144

Exercise 2:

# For 5 decimal

>> syms x;

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

a=2;

b=3;

error=0.00001;

fa = eval(subs(y,x,a));

fb = eval(subs(y,x,b));

if fa\*fb > 0

disp('Root does not exist between the range');

else

c = a - (a-b) \* fa/(fa-fb);

fc = eval(subs(y,x,c));

i=1;

while abs(fc)>error

i=i+1;

if fa\*fc< 0

b =c;

fb = eval(subs(y,x,b));

else

a =c;

fa = eval(subs(y,x,a));

end

c = a - (a-b) \* fa/(fa-fb);

fc = eval(subs(y,x,c));

end

fprintf('\nRoot is: %f\n', c);

end

i

Root is: 2.094551

i =

12

# For 8 decimal:

>> syms x;

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

a=2;

b=3;

error=0.00000001;

fa = eval(subs(y,x,a));

fb = eval(subs(y,x,b));

if fa\*fb > 0

disp('Root does not exist between the range');

else

c = a - (a-b) \* fa/(fa-fb);

fc = eval(subs(y,x,c));

i=1;

while abs(fc)>error

i=i+1;

if fa\*fc< 0

b =c;

fb = eval(subs(y,x,b));

else

a =c;

fa = eval(subs(y,x,a));

end

c = a - (a-b) \* fa/(fa-fb);

fc = eval(subs(y,x,c));

end

fprintf('\nRoot is: %f\n', c);

end

Root is: 2.094551

>> i

i =

19

Exercise 4:

>> clear all

>> a=[1 0 -2 -5];

x1=2;

x2=3;

for i=1:1000

m=x1-[(polyval(a,x1)\*(x2-x1))/(polyval(a,x2)-polyval(a,x1))];

n=polyval(a,m);

e=abs(n);

if(e<=10^-5)

break;

end

if polyval(a,x1)\* polyval(a,m)

x2=m;

continue

else

x1=m;

continue

end

end

>> m

m =

2.0946