Mahatma Gandhi Mission's College of Engineering and Technology

Scilab programs Engineering Mathematics-II Ay 2020-21

Q1. By using taylors series method solve $\frac{dy}{dx}=x^2y-1$ and y=1,when x=0. Find y when x =0.1 and 0.2

```
clc;
x=0;
y=1;
x1=0.1;
x2=0.2;
y1=(x^2)*y-1;
y2=(x^2)*y1+2*x*y;
y3=(x^2)*y2+4*x*y1+2*y;
y4=(x^2)*y3+6*x*y2+6*y1;
disp("by using taylors series method",);
ANS=y+x1*y1+(x1^2/2.0)*y2+(x1^3/6.0)*y3+(x1^4/24.0)*y4;
disp('y(0.1)=');
disp(ANS);
ANS1=y+x2*y1+(x2^2/2.0)*y2+(x2^3/6.0)*y3+(x2^4/24.0)*y4;
disp('y(0.2)=');
disp(ANS);
```

output

by using taylors series method

y(0.1)= 0.9003083

y(0.2) = 0.8022667

2.Apply Simpson's $\frac{1}{3}$rd rule to find the value of $\int_0^6 \frac{dx}{1+x^2}$ up to two places of decimals.

```
clc;
x=(0:1:6);
h=1;
y=[1,0.5,0.2,0.1,0.06,0.04,0.04,0.03];
[m,n]=size(x);
E=0;
O=0;
X=y(1,1)+y(1,n);
for i=2:n-1
if(modulo(i,2)==0)
O=O+y(1,i);
else
E=E+y(1,i);
end
end
ANS=(h/3.0)*[X+2*E+4*O];
disp("by using simpsons 1/3rd rule",)
disp(ANS);
```

output

by using simpsons 1/3rd rule

1.3733333

3.Apply Simpson's 3/8 rule to find the value of $\int_{20}^{26} ydx$, use the tabulated values of y given below

x	20	21	22	23	24	25	26
y	95.2	96.85	97.77	98.68	96.56	100.41	101.24

```
clc;
x=(20:1:26);
h=1;
y=[95.2,96.85,97.77,98.68,96.56,100.41,101.24];
[m,n]=size(x);
T=0;
R=0;
X=y(1,1)+y(1,n);
for i=2:n-1
if(modulo(i-1,3)==0)
T=T+y(1,i);
else
R=R+y(1,i);
end
end
ANS=(3*h/8.0)*[X+2*T+3*R];
disp("by using simpsons 3/8th rule",)
disp(ANS);
```

output

by using simpsons 3/8th rule

588.21375

4. Trace the curve for r=a(1+sinθ)

```
theta=0:.01:2*%pi;
a=2;
r=a*(1+sin(theta));
polarplot(theta,r,leg="cardioide:r=1+sin(theta)")
```