For the given ordinary differential equation

1. Find the exact solution using MATLAB’s built-in function ‘dsolve’.
2. Find the numerical solution using MATLAB’s built-in function ‘ode45’.
3. Plot the exact solution and the numerical solution in the same figure in the interval

y=dsolve('Dy=3\*x+y/2','y(0)=1','x')

x=0:0.1:1;

z=eval(y);

plot(x,z,'\*')

hold on

y0=1;

xspan=[0,1];

f=@(x,y) 3\*x+y/2;

[x,y]=ode45(f,xspan,y0);

plot(x,y,'r','LineWidth',2)

Output

y =

13\*exp(x/2) - 6\*x – 12

