%cau1

clear all

clc

syms x y z a b c

f = (a\*x + b\*y + c\*z)\*asin(x\*y\*z)

%Dao ham rieng cap 1

disp('Dao ham rieng cap 1')

zx = diff(f,x)

zy = diff(f,y)

zz = diff(f,z)

% Dao ham rieng cap 2

disp('Dao ham rieng cap 2')

zxx = diff(zx,x)

zxy = diff(zx,y)

zxz = diff(zx,z)

zyy = diff(zy,y)

zyz = diff(zy,z)

zzz = diff(zz,z)

%cau2

% a

clear all

clc

syms x y

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

simplify(int(int(f,y,0,pi/3),x,0,pi/6))

% b

clear all

clc

syms x y

f = x^2 + 2\*y

int(int(f,y,x^3,x),x,0,1)

%c

clear all

clc

syms t

f = exp(t)

int(f,t,1,4)

%d

% tham so hoa x=t, y = 1+t^2

syms t

f = (2\*t^3 + 3\*t)/sqrt(1+3\*t^2+t^3)

simplify(int(f,t,-1,1))

% Cau 03

clear all

clc

syms x y

s = 0;

f(x,y) = x\*exp(-x\*y);

delx = (20-0)/200;

dely = (10-0)/200;

for i = 0:199

for j = 0:199

u = (i + 0.5)\*delx ;

v = (j + 0.5)\*dely ;

f\_value = u\*exp(-u\*v)

s = s + f\_value\*delx\*dely

end

end

disp(s)

%Cau 4

% a

f = dsolve ('Dy + y = 1','y(0) = 1')

fplot(dsolve('Dy+y=1','y(0)=1'),'k--');

% b

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

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

% c

dsolve ('D2y - 4\*y = exp(x)\*cos(x) + x^3','y(0) = 1','Dy(0) = 2','x')

fplot(dsolve ('D2y - 4\*y = exp(x)\*cos(x) + x^3','y(0) = 1','Dy(0) = 2','x'),'r--');

%Cau 5

syms x y

a = -10:1:10

b = -10:1:20

[X,Y] = meshgrid(a,b)

Z = 6\*exp(-3\*X.^2 - Y.^2) + X./2 + Y

mesh(X,Y,Z)

%Cau 6

clear all

clc

syms x y

% f(x, y) = x.\*y - (x.^3)/3;

[x,y] = meshgrid(-5:.5:5, -5:.5:5);

% P = subs(diff(f, x), {x y}, {X Y});

% Q = subs(diff(f, y), {x y}, {X Y});

% quiver3(X, Y , P , Q);

fx = y - 3\*x^2

fy = x

quiver(x,y,fx,fy)