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clc
clear all
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```
%Bai 01
disp("Bai01:");
syms x y z a b c
f = (a*x + b*y + c*z)*asin(x*y*z);
disp("Dao ham cap 1:");
fprintf("fx(x,y,z) = ");
disp(diff(f,x));
fprintf("fy(x,y,z) = ");
disp(diff(f,y));
fprintf("fz(x,y,z) = ");
disp(diff(f,z));
disp("Dao ham cap 2:");
fprintf("fxx(x,y,z) = ");
disp(diff(f,x,2));
fprintf("fyy(x,y,z) = ");
disp(diff(f,y,2));
fprintf("fzz(x,y,z) = ");
disp(diff(f,z,2));
fprintf("fxy(x,y,z) = ");
disp(diff(diff(f,x),y));
fprintf("fyx(x,y,z) = ");
disp(diff(diff(f,y),x));
fprintf("fyz(x,y,z) = ");
disp(diff(diff(f,y),z));
fprintf("fzy(x,y,z) = ");
disp(diff(diff(f,z),y));
fprintf("fxz(x,y,z) = ");
disp(diff(diff(f,x),z));
fprintf("fzx(x,y,z) = ");
disp(diff(diff(f,z),x));
```

```
%Bai02
disp("Bai02:");
clear all
syms x y
fprintf("2.a ans = ");
disp(int(int(x*sin(x+y),x,0,pi/6),y,0,pi/3));
fprintf("2.b ans = ");
disp(int(int(x^2 + 2*y,y,x^3,x),x,0,1));
% tham so hoa la x = t, y = sqrt(t), t [1,4]
syms t
fc = exp(t);
fprintf("2.c ans = ");
disp(int(fc*diff(t),t,1,4));
% tham so hoa la x = t, y = 1 + t^2, t [-1,1]
u = x/sqrt(x^2 + y^2);
v = y/sqrt(x^2 + y^2);
ut = subs(subs(u,x,t),y,1+t^2);
vt = subs(subs(v,x,t),y,1+t^2);
fprintf("2.d ans = ");
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disp(int(ut*diff(t),t,-1,1) + int(vt*diff(1+t^2),t,-1,1));
```

```
%Bai03
disp("Bai03");
clear all
% Diem mau goc phan tu
X = 0:0.01:19;
Y = 0:0.01:9;
f = @(x,y) x*exp(-1*x*y);
result = 0;
for i = 1:1:length(X)
    for j = 1:1:length(Y)
        result = result + f(X(i),Y(j))*0.01*0.01;
    end
end
disp(result);
```

```
%Bai04
%a
clear all
syms y(x)
solutionA(x) = dsolve(diff(y,x) + y == 1, y(0) == 1);
fprintf("4.a ans = ");
disp(solutionA);
z = linspace(-10,10);
plot(z,solutionA(z))
xlim([-10 10])
ylim([-20,20])
xlabel('x')
ylabel('y')
```

```
%b
close all
clear all
syms y(x)
solutionB(x) = dsolve((x^2+1)*diff(y,x) + 3*x*(y-1)==0, y(0)==2);
fprintf("4.b ans = ");
disp(solutionB);
z = linspace(-10,10);
plot(z,solutionB(z));
xlim([-10 10])
ylim([-3,3])
xlabel('x')
ylabel('y')
```

```
%c
close all
clear all
syms y(x)
solutionC(x) = dsolve(diff(y,x,2)-4*y == exp(x)*cos(x) +
x^3,y(0)==1,subs(diff(y),x,0)==2);
fprintf("4.c ans = ");
disp(solutionC);
z = linspace(-10,10);
plot(z,solutionC(z));
```

```

xlim([-10 10])
ylim([-20,20])
xlabel('x')
ylabel('y')

%Bai05
close all
clear all
a = -10:.2:10;
b = -10:.2:20;
[X,Y] = meshgrid(a,b);
Z = 6*exp(-3*X.^2-Y.^2) + X/2 + Y;
plot3(X,Y,Z);

%Bai06
close all
clear all
%gradient: <y - x^2, x>
[x,y] = meshgrid(-5:.5:5,-5:.5:5);
P = y - x^2;
Q = x;
quiver(x,y,P,Q);

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