Draw a two dimensional vector field for the given vector.

clc

clear all

syms x y

F=input('Enter the vector as i and j order in vector form: ');

P=inline(vectorize(F(1)),'x','y');

Q=inline(vectorize(F(2)),'x','y');

x=linspace(0,1,10);

y=x;

[X,Y]=meshgrid(x,y);

U=P(X,Y);

V=Q(X,Y);

quiver(X,Y,U,V,1)

axis on

xlabel('x')

ylabel('y')

Command Window:-

Enter the vector as i and j order in vector form: [x,y]

>> P

P = Inline function:

P(x,y) = x

>> Q

Q = Inline function:

Q(x,y) = y



Draw the three dimensional vector field for the given vector.

clc

clear all

syms x y z

F=input('Enter the vector as i,j and k order in vector form: ');

P=inline(vectorize(F(1)),'x','y','z');

Q=inline(vectorize(F(2)),'x','y','z');

R=inline(vectorize(F(3)),'x','y','z');

x=linspace(-1,1,5);

y=x;

z=x;

[X,Y,Z]=meshgrid(x,y,z);

U=P(X,Y,Z);

V=Q(X,Y,Z);

W=R(X,Y,Z);

quiver3(X,Y,Z,U,V,W,1.5)

axis on

xlabel('x')

ylabel('y')

zlabel('z')

Command Window:-

Enter the vector as i,j and k order in vector form: [x -y z]

>>



Find the gradient of a function.

clc

clear all

syms x y

f=input('Enter the function f(x,y): ');

f1=diff(f,x);

f2=diff(f,y);

P=inline(vectorize(f1),'x','y')

Q=inline(vectorize(f2),'x','y')

x=linspace(-2,2,10);

y=x;

[X,Y]=meshgrid(x,y);

U=P(X,Y)

V=Q(X,Y)

V=4\*ones(size(U))

quiver(X,Y,U,V,1)

axis on

xlabel('x')

ylabel('y')

hold on

ezcontour(f,[-2,2])

Command Window:-

Enter the function f(x,y): x^2-4\*y

P =Inline function:

P(x,y) = 2.\*x

Q = Inline function:

Q(x,y) = -4

U =

Columns 1 through 8

-4.0000 -3.1111 -2.2222 -1.3333 -0.4444 0.4444 1.3333 2.2222

-4.0000 -3.1111 -2.2222 -1.3333 -0.4444 0.4444 1.3333 2.2222

-4.0000 -3.1111 -2.2222 -1.3333 -0.4444 0.4444 1.3333 2.2222

-4.0000 -3.1111 -2.2222 -1.3333 -0.4444 0.4444 1.3333 2.2222

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-4.0000 -3.1111 -2.2222 -1.3333 -0.4444 0.4444 1.3333 2.2222

-4.0000 -3.1111 -2.2222 -1.3333 -0.4444 0.4444 1.3333 2.2222

Columns 9 through 10

3.1111 4.0000

3.1111 4.0000

3.1111 4.0000

3.1111 4.0000

3.1111 4.0000

3.1111 4.0000

3.1111 4.0000

3.1111 4.0000

3.1111 4.0000

3.1111 4.0000

V = -4

V =4 4 4 4 4 4 4 4 4 4

4 4 4 4 4 4 4 4 4 4

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4 4 4 4 4 4 4 4 4 4

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4 4 4 4 4 4 4 4 4 4

4 4 4 4 4 4 4 4 4 4



clc

clear all

syms x y z

viewSolid(z,0+0\*x+0\*y,x-3\*y^2+0\*y,y,1+0\*x,2+0\*y,x,0,2)

int(int(x-3\*y^2+0\*y,y,1,2),x,0,2)

ans =-12

