```
clear all
clc
close all
format short

% Cálculo numérico para engenharia elétrica com Matlab
% Capítulo 6: derivação numérica
% Gradiente

figure

[X,Y]=meshgrid(-2:.2:2,-2:.2:2);
E = X.*exp(-X.^2 - Y.^2);
[DX,DY]=gradient(E,.2,.2);
quiver(X,Y,DX,DY,'k')
hold on

[X,Y]=meshgrid(-2:.1:2,-2:.1:2);
E = X.*exp(-X.^2 - Y.^2);
contour(X,Y,E,6,'k','ShowText','on')
hold on

x1=0.70; y1=0;
x2=-0.70; y2=0;
plot(x1,y1,'ko','MarkerFaceColor','k','MarkerSize',12)
plot(x2,y2,'ko','MarkerSize',12)
```