
```
clc
clear all
close all
syms x y z lam
f=6*x-y^2+x*z+60
g=x^2+y^2+z^2-36
gradf=gradient(f,[x,y,z])
gradg=gradient(g,[x,y,z])
lagr=gradf-lam*gradg
[lamsol,xsol,ysol,zsol]=solve(lagr(1),lagr(2),lagr(3),g);
double([xsol,ysol,zsol,lamsol]);
real(double([xsol,ysol,zsol,lamsol]))
hfun=inline(vectorize(f))
values=real(double(hfun(xsol,ysol,zsol)))
```

$f =$

$$-y^2 + 6x + xz + 60$$

$g =$

$$x^2 + y^2 + z^2 - 36$$

$gradf =$

$$\begin{matrix} z + 6 \\ -2y \\ x \end{matrix}$$

$gradg =$

$$\begin{matrix} 2x \\ 2y \\ 2z \end{matrix}$$

$lagr =$

$$\begin{matrix} z - 2\lambda x + 6 \\ -2y - 2\lambda y \\ x - 2\lambda z \end{matrix}$$

$ans =$

0	0	-6.0000	0
-4.0000	-4.0000	2.0000	-1.0000
-4.0000	4.0000	2.0000	-1.0000
-5.1962	0	3.0000	-0.8660

5.1962	0	3.0000	0.8660
--------	---	--------	--------

hfun =

Inline function:

*hfun(x,y,z) = 6.*x + x.*z - y.^2 + 60*

values =

60.0000
12.0000
12.0000
13.2346
106.7654

Published with MATLAB® R2023b