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Course:MAT1001

1)Q1)screen shot of the code

```
%clc
%clear all
syms x
f=x*(71-2*x)*(71-2*x);
df=diff(f);
roots = solve(df==0);
ddf=diff(df);
ddfval=subs(ddf, x, roots);
for i=1:length(ddfval)
    if ddfval(i)<0
        fprintf('f is maximum')
        xmaxvalue=double(roots(i))
        fmax=subs(f, x, roots(i))
        maxvolume=double(fmax)
    else
        fprintf('f is minimum')
        xminvalue=double(roots(i))
        fmin=subs(f, x, roots(i))
        minvolume=double(fmin)
    end
end
```

Q2)screen shot of the command window

```
xmaxvalue =

   11.8333


fmax =

715822/27


maxvolume =

   2.6512e+04

f is minimum
xminvalue =

   35.5000


fmin =

0


minvolume =

     0

>>
```

2) Q1)screen shot of the code

```
clc
clear all
syms x y L;
f=(x^2)*y;
diff_f=gradient(f, [x, y]);
fx=diff_f(1);
fy=diff_f(2);
g=(x^2+4*x*y)-48;
diff_g=L*gradient(g, [x, y]);
gx=diff_g(1);
gy=diff_g(2);
eqns=[fx-gx==0,fy-gy==0,g==0];
vars=[x y L];
[sol_x, sol_y, sol_L] = solve(eqns, vars);
xyL_Values= [sol_x(:), sol_y(:), sol_L(:)]
[m,n]=size(xyL_Values);
for i=1:m
    result(i)=subs(f,[x,y,L],xyL_Values(i,:));
end
result
f_min=min(result)
ind_fmin=find(result==f_min)
f_max=max(result)
ind_fmax=find(result==f_max)
mvar=xyL_Values(ind_fmax,:);
```

Q2)screen shot of the command window

```
[-4, -2, -1]
[ 4,  2,  1]


result =

[-32, 32]


f_min =

-32


ind_fmin =

     1


f_max =

32


ind_fmax =

     2
```