"QUIZ" for Lecture 11

NAME: (print!) Wenhao Li **Section:** 22,23,24

E-MAIL SCANNED .pdf OF COMPLETED QUIZ to DrZcalc3@gmail.com (Attachment: q11FirstLast.pdf) ASAP BUT NO LATER THAN Oct. 12, 8:00pm Deadline extended to Oct. 17

1. Use Largange multipliers (no credit for other methods) to find the **smallest** value that $x+y+z$ can be, given that $xyz = 125$

fx=1 fy=1 fz=1
graf=<1,1,1>
gx=yz gy=xz gz=xy
grag=<yz,xz,xy>
graf=Lgrag
<1,1,1>=L<yz,xz,xy>
1=Lyz 1=Lxz 1=Lxy
xyz = 125
1=L^3(xyz)^2

1=L^3(x*(1/L))^2
x=sqrt1/L
1=L^3(y*(1/L))^2
y=sqrt1/L
1=L^3(z*(1/L))^2
z=sqrt1/L

sqrt1/L*sqrt1/L*sqrt1/L=125
L=1/25

x=5 y=5 z=5
which means the point (5,5,5)
plug in
5+5+5=15
The smallest value is 15.

2. Use Largange multipliers (no credit for other methods) to find the **largest** value that xyz can be, given that $x + y + z = 15$

fx=yz fy=xz fz=xy
graf=<yz,xz,xy>
gx=1 gy=1 gz=1
grag=<1,1,1>
graf=Lgrag
<yz,xz,xy>=L<1,1,1>
yz=L xz=L xy=L x + y + z = 15
(xyz)^2=L^3

(xL)^2=L^3
x=sqrtL
(yL)^2=L^3
y=sqrtL
(zL)^2=L^3
z=sqrtL
sqrtL+sqrtL+sqrtL=15
L=25
x=5 y=5 z=5
which means the point (5,5,5)
plug in 5*5*5=125
the largest value is 125.