Wenhao Li   22, 23, 24

NAME: (print!) _____   **Section:** _____

E-MAIL SCANNED .pdf OF COMPLETED QUIZ to DrZcalc3@gmail.com (Attachment: q10FirstLast.pdf) ASAP BUT NO LATER THAN Oct. 8, 8:00pm

1. Find the local maximum and minimum point(s), the local maximum and minimum values, and saddle point(s) of the function

$$f(x, y) = 12x^2 - 4x^3 + 6y^2 + 12xy \quad .$$

```
fx=24x-12x^2+12y
fy=12y+12x
fxx=24-24x
fxy=12
fyy=12
24x-12x^2+12y=0   12x-x^2+y=0   12y+12x=0   x+y=0 y=-x
x1=11 x2=0 x+y=0 y1=-11 y2=0
(11,-11)  (0,0)

fxx(11,-11)=-240
fxy(11,-11)=12
fyy(11,-11)=12
D=-240*12-12^2=-3024is negative,
this is a saddle point.

fxx(0,0)=24
fxy(0,0)=12
fyy(0,0)=12
D=24*12-12^2=144
D>0 fxx>0 is a local minimum and the local minimum value is f(0,0)=0
```