

"QUIZ" for Lecture 10

NAME: (print!) Fayed Raza Section: 6

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

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

max point

max value

none

none

min point
 $x=0$

min value
 $(0, 24)$

Saddle point
none

$$\frac{d}{dx} 24x - 12x^2 + 12y = 24 - 24x$$

$$\frac{d}{dy} 12y + 12x = 12$$

$$\frac{d}{dx} f(x, y) = 24x - 12x^2 + 12y$$

$$\frac{d}{dy} f(x, y) = 12y + 12x$$

$$24x - 12x^2 + 12y = 0$$

$$12y + 12x = 0 \Rightarrow y = -x$$

$$24x - 12x^2 - 12x = 0$$

$$12x - 12x^2 = 0$$

$$12x(1 - x) = 0$$

$$x = 0 \text{ or } x = 1$$

$$y = 0 \text{ or } y = -1$$