"QUIZ" for Lecture 10

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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

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

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

$f_{xx} = 24 - 24x$

$f_y = 12y + 12x$

$f_{yy} = 12$

$f_{xy} = 12$

$\left. \begin{array}{l} f_{xx} = 0 \\ f_{yy} = 12 \\ f_{xy} = 12 \end{array} \right\} \rightarrow D = 0(12) - 12^2$

$D = -144$

$\left[\begin{array}{l} f_x = 24x - 12x^2 + 12y = 0 \\ f_y = (12y + 12x) = 0 \end{array} \right.$

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

$12x(x-1) = 0$

$x = 0, x = 1 \bigg\} \rightarrow (1, -1)$

$y = -1$

∴ $(1,-1)$ is neither a local max. or min. and instead is a saddle point. So, the function does not have a local max or min.