

**MATH 206 (Multivariable Differential and Integral Calculus)**

**Assignment-1st Semester 1446 H**

**To be submitted on or before 10-04-1446 H (13-10-2024)**

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| **Student Name** | **Student ID** |
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| **Question Number** | **I** | **II** | **Total** |
| **Mark** |  |  |  |

**Instructions**

* Use any trusted source of information with proper citation and no plagiarism
* Work on this assignment as groups of three

**[I]** Let $f\left(x,y\right)=\left\{\begin{matrix}\frac{y(x+1)^{2}+y^{2}\sin((πx))}{(x+1)^{2}+y^{2}},&(x,y)\ne (-1,0)\\0,&\left(x,y\right)=(-1,0)\end{matrix}\right.$

a. **Show** that $f$ is continuous at the point $\left(-1,0\right)$

b. **Find** $f\_{y}\left(-1,0\right)$

c. **Find** $f\_{x}\left(0,1\right)$

**[II]** Find the extrema and saddle points of$f\left(x,y\right)=x^{2}+xy$on the region bounded by the graphs $y=x^{2} $and $y=4$

Good Luck ☺