King Saud University Department of Mathematics $2^{\text {nd }}$ Semester 1445 H

MATH 201 (Differential and Integral Calculus)
Assignment
To be submitted on or before 14-10-1445 H

| Student Name | Student ID |
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| Question Number | I | II | Total |
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Instructions

- Use any trusted source of information with proper citation and no plagiarism
- Work on this assignment as groups of two
[I] Let $f(x, y)=\left\{\begin{array}{cl}\frac{y(x+1)^{2}+y^{2} \sin (\pi x)}{(x+1)^{2}+y^{2}}, & (x, y) \neq(-1,0) \\ 0, & (x, y)=(-1,0)\end{array}\right.$
a. Show that $f$ is continuous at the point $(-1,0)$
b. Find $f_{y}(-1,0)$
c. Find $f_{x}(0,1)$
[II] Find the extrema and saddle points of $f(x, y)=x^{2}+x y$ on the region bounded by the graphs $y=x^{2}$ and $y=4$

