

**King Saud University MATH 201 (Differential and Integral Calculus)**

**Department of Mathematics** **Assignment**

**1st Semester 1445 H To be submitted on or before 14-10-1445 H**

 **23-04-2024**

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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 $w=f(u,v)$ where$u=x+y$and $v=xy$. Show that

$$\frac{∂^{2}w}{∂y∂x}=\frac{∂^{2}w}{∂u^{2}}+u\frac{∂^{2}w}{∂u∂v}+v\frac{∂^{2}w}{∂v^{2}}+\frac{∂w}{∂v}$$

**[II]** Find the extrema and saddle points of$f\left(x,y\right)=y^{2}+xy$on the region bounded by the graphs $x=y^{2} $and $x=9$

Good Luck ☺