

King Fahd University of Petroleum and Minerals  
Department of Mathematics and Statistics  
Math-201 Semester-121 QUIZ IV

NAME:

S.No.

ID:

Maximum Marks: 10

Section:07

Time Allowed: 25 minutes

(1) Let  $f(x, y) = \ln(9 - x^2 - 9y^2)$ .

(i) Find and sketch the domain.

(ii) Find the range of  $f$ .

(2) If  $g(s, t) = f(s^2 - t^2, t^2 - s^2)$  and  $f$  is differentiable, show that  $g$  satisfies the equation  $t \frac{\partial g}{\partial s} + s \frac{\partial g}{\partial t} = 0$ .