King Fahd University of Petroleum and Minerals

MATH 201 QUIZ #3 Term 142

Name:	ID:	Sec:

Q1. Find the plane determined by the intersecting two lines L_1 and L_2

$$L_1: x = -1 + t, \quad y = 2 + t, \quad z = 1 - t$$

$$L_2: x = 1 - 4s, \quad y = 1 + 2s, \quad z = 2 - 2s$$

Q2 Sketch the surface

$$x^2 - y^2 + z^2 - 2x + 2y + 4z + 2 = 0$$

Q3 Let $f(x,y) = x^2 - xy + y^2 - y$. Find the directions **u** and the value $D_u f(-1,1)$ for which

a) $D_u f(-1,1)$ is largest
b) $D_u f(-1,1) = 0$
c) $D_u f(-1,1)$ is smallest
d) $D_u f(-1,1) = 4$

Q4 Find the equations of the **tangent plane** and the **normal line** to the surface

$x^2 + 2xy - y^2 + z^2 = 7$ at the point $P_0 = (1,-1,3)$