Name:

Quiz 2B

MAC2313 L4-L6

1. [6 pts] Find BOTH parametric and symmetric equations for the line through the point $(5, 6, -1)$ and perpendicular to both $\vec{u} =< 2, 2, 3 >$ and $\vec{v} =< 1, -1, -2 >$. Use the parameter t.

$u \times v \Rightarrow$ $\begin{matrix} i & j & k & i & j \\ 2 & 2 & 3 & 2 & 2 \\ 1 & -1 & -2 & 1 & -1 \end{matrix}$ $= -4i + 3j - 2k + 4j + 3i - 2k$

$= \langle -1, 7, -4 \rangle$

Eq of line $= (5, 6, -1) + t\langle -1, 7, -4 \rangle$

parametric:

$x = 5 - t$

$y = 6 + 7t$

$z = -1 - 4t$

symmetric: $t = 5 - x$

$t = \frac{y-6}{7}$

$t = \frac{z+1}{-4}$

$5 - x = \frac{y-6}{7} = \frac{z+1}{-4}$

2. [4 pts] Reduce the equation to one of the standard forms and identify the surface.

$$x^2 + 4y^2 - 6x - 4z + 9 = 0$$

$x^2 - 6x + 9 + 4y^2 - 4z = -9 + 9$

$(x-3)^2 + 4y^2 - 4z = 0$

↑ one linear term

$(x-3)^2 + 4y^2 = 4z$

divide by 4

$\frac{(x-3)^2}{4} + y^2 = z \Rightarrow$ elliptic paraboloid