

MATH 133: Vectors, Matrices and Geometry

Written Assignment 4

Due in tutorial or by Friday 1pm the week of October 13, 2003

**Write the name of your tutor and your tutorial section number
in the top right corner of the first page.**

Justify all of your assertions.

Problem.

- (a) If the planes $a_1x + b_1y + c_1z = d_1$ and $a_2x + b_2y + c_2z = d_2$ intersect in a line L , show that any plane containing L is of the form

$$A(a_1x + b_1y + c_1z) + B(a_2x + b_2y + c_2z) = Ad_1 + Bd_2$$

for suitable scalars A, B . Use this to find the equation of the plane passing through point $(1, 2, 3)$ and containing the line of intersection of the planes $2x + 3y - 4z = 1$, $3x - 2y + 4z = 1$.

- (b) Using the theory of linear equations, show that three planes in \mathbb{R}^3 which do not intersect in a point have coplanar normal vectors.