MCV4U UNIT 2 LINES AND PLANES

Name: _____ Date: _____

Unit 2: Lines and Planes	**Knowledge (28)**	**Application (24)**	**Communication (16)**

Show ALL work for full marks. 2C marks per question

1. [K4 A2] a) Determine the symmetric equations for the line through *P(5, 6, 10)* and parallel to the line with equation $\vec{r}$ *= (6, 1, 1) + t(−2, 1, 3).*

   b) Determine two other points on this line.

2. [K5 A2] Determine the intersection, if any, of the planes with equations *x + y – z + 12 =0* and *2x + 4y - 3z + 8 = 0.*

3. [4K 1A] Determine the distance between the point P(1,2,3) and the plane 3x− 4z − 1 = 0, correct to 2 d.p.

4. Solve the following system of equations and give a geometrical interpretation of the result. [KA6]

$x + 3y + 4z = 10$
$2x + 4y - 3z = 23$
$3x - y + 6z = -4$

5. [5K 2A] Find the point of intersection of the line $(x,y,z) = (1, -2,1) + t(4, -3, -2)$ and the plane $x + y - z = 1$.

6. [4K 2A] Find the scalar equation of the line with vector equation (x,y) = (−1,2) + t(3,7) , $t \epsilon \mathbb{R}$.

7. [A4] Determine a vector equation for the line that is perpendicular to the vectors $\vec{u}$= (2,0,1) and $\vec{v}$= (0,3, −1) and passes through the point (5,2,1).

8. [A5] Determine a scalar equation for the plane that passes through the point *(2, 0, −1)* and is perpendicular to the line of intersection of the planes $2x + y – z + 5 = 0$ and $x + y + 2z + 7 = 0$.