

Name: _____ **MCV4U - Unit 2 Assignment – Lines and Planes** **15A** **14T** **18C**

- Determine parametric equations for the plane through the points $A(2, 1, 1)$, $B(0, 3, 4)$, and $C(1, 7, -2)$. [A4 C1]
- Determine a scalar equation for the plane through the points $M(1, 2, 3)$ and $N(3, 2, -1)$ that is perpendicular to the plane with equation $2x + 3y - z + 1 = 0$. [A5 C2]
- Solve the following system of equations and give a geometrical interpretation of the result.[A6 C2]
$$\begin{aligned}x + 3y + 2z &= 6 \\2x + 4y - 3z &= 20 \\3x - y + 7z &= -14\end{aligned}$$

4. A line passes through the points A(4,-2,5) and B (3,-2,-4) [C] (7)

a) Write a vector equation for the line containing these points (3)

b) Write parametric equations corresponding to the vector equation you wrote in part a [2]

c) Explain why there are no symmetric equations for this line. [2]

5. Explain why there are many different vector and parametric equations for a line. [TC3]

6. Find the value of k so that the lines $\frac{x-2}{3k+1} = \frac{y-3}{k} = \frac{z+9}{1}$ and $\frac{x-4}{2} = \frac{y+3}{-3k} = \frac{z-2}{7}$ are perpendicular. [T4]

7. Does the line with equation $(x, y, z) = (10, 4, -4) + u(1, 2, 3)$ lie in the plane with equation $(x, y, z) = (3, 0, 1) + s(1, 2, -1) + t(3, 1, -2)$?
- Justify your answer algebraically. (solving systems) [T5 C2]
 - Confirm your answer using a secondary method. [T2 C1]