Question 14 **(11 marks)**

Plane P_1 has Cartesian equation: $z = 2x + y + 4$.

Line L has equation given by: $\underset{\sim}{r} = \begin{pmatrix} 2 - \lambda \\ 1 + \lambda \\ 2\lambda \end{pmatrix}$.

(a) Determine a vector that is perpendicular to plane P_1. (2 marks)

(b) Write the equation for plane P_1 in vector form. (2 marks)

(c) Determine the acute angle, correct to the nearest degree, between plane P_1 and line L.
(3 marks)

(d) Obtain the Cartesian equation of the plane P_2 that contains the line L and is perpendicular to plane P_1. (4 marks)