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5. The plane Π has equation

$$\mathbf{r} = \begin{pmatrix} 4 \\ 2 \\ 1 \end{pmatrix} + \lambda \begin{pmatrix} 1 \\ 0 \\ 2 \end{pmatrix} + \mu \begin{pmatrix} 2 \\ 1 \\ 3 \end{pmatrix}$$

where λ and μ are scalar parameters.

(a) Find a vector perpendicular to Π

(2)

The line l passes through the point A with coordinates $(2, -4, 0)$ and meets Π at the point with coordinates $(3, 2, -1)$.

The acute angle between the plane Π and the line l is α.

(b) Find α, giving your answer to the nearest degree.

(4)

(c) Find the perpendicular distance from A to Π

(4)

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Question 5 continued

(Total 10 marks)

Q5