8. The plane Π has equation

$$3x + 4y - z = 17$$

The line l_1 is perpendicular to Π and passes through the point $P(-4, -5, 3)$

The line l_1 intersects Π at the point Q

(a) Determine the coordinates of Q

(4)

Given that the point $R(-1, 6, 4)$ lies on Π

(b) determine a Cartesian equation of the plane containing PQR

(4)

The line l_2 passes through P and R

The line l_3 is the reflection of l_2 in Π

(c) Determine a vector equation for l_3

(4)

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

Question 8 continued

Question 8 continued

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

Question 8 continued

(Total for Question 8 is 12 marks)

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA