4 The point A has coordinates $(-4, -10)$ and the point B has coordinates $(3, 11)$
The line l passes through A and B.

(a) Find an equation of l.

(2)

The point P lies on l such that $AP : PB = 3 : 4$

(b) Find the coordinates of P.

(2)

The point Q with coordinates (m, n), where $m < 0$, lies on the line through P that is perpendicular to l.

Given that the length of PQ is $\sqrt{10}$

(c) find the coordinates of Q.

(6)

The point R has coordinates $(-11, -21)$

(d) Show that

(i) AB and RQ are equal in length,

(ii) AB and RQ are parallel.

(4)

(e) Find the area of the quadrilateral $ABQR$.

(2)

Question 4 continued

Question 4 continued

Question 4 continued

(Total for Question 4 is 16 marks)