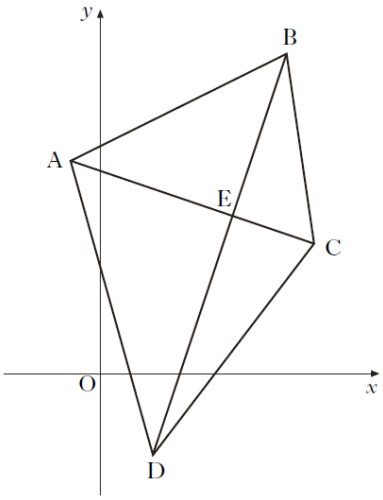
Higher Maths Homework – The Straight Line

1) A quadrilateral has vertices A(–1, 8), B(7, 12), C(8, 5) and D(2, –3) as shown in the diagram.



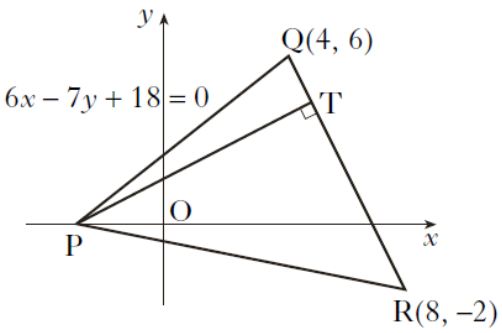
(*a*) Find the equation of diagonal BD.

(*b*) The equation of diagonal AC is $x + 3y = 23$. Find the coordinates of E, the point of intersection of the diagonals. 3

(*c*) (i) Find the equation of the perpendicular bisector of AB.

(ii) Show that this line passes through E. 5

2) Triangle PQR has vertex P on the *x*-axis, as shown in the diagram.
Q and R are the points (4, 6) and (8, –2) respectively.
The equation of PQ is $6x – 7y + 18 = 0$.

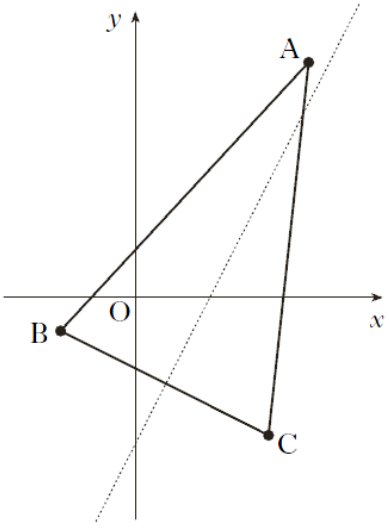


(*a*) State the coordinates of P.

(*b*) Find the equation of the altitude of the triangle from P.

(*c*) The altitude from P meets the line QR at T. Find the coordinates of T. 4

3) The vertices of triangle ABC are A(7, 9), B(–3, –1) and C(5, –5) as shown in the diagram.
The broken line represents the perpendicular bisector of BC.



(*a*) Show that the equation of the perpendicular bisector of BC is $y = 2x – 5$. 4

(*b*) Find the equation of the median from C. 3

(*c*) Find the coordinates of the point of intersection of the perpendicular bisector of BC and the median from C. 3

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