

STEP II, 1998, Q8

- 8 Points A, B, C in three dimensions have coordinate vectors $\mathbf{a}, \mathbf{b}, \mathbf{c}$, respectively. Show that the lines joining the vertices of the triangle ABC to the mid-points of the opposite sides meet at a point R .

P is a point which is **not** in the plane ABC . Lines are drawn through the mid-points of BC, CA and AB parallel to PA, PB and PC respectively. Write down the vector equations of the lines and show by inspection that these lines meet at a common point Q .

Prove further that the line PQ meets the plane ABC at R .



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