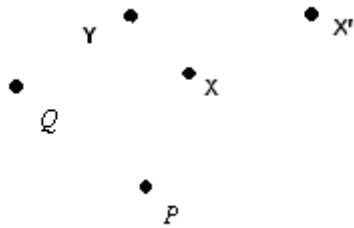


- 1) Given the points $P(1,-1), Q(2,0,1), R(-1,1,2)$ find the coordinates of the points X and Y such that PQRX y PQYR are parallelograms.
- 2) Given the points P_1, P_2 and P_3 , check that there exists a unique point G (called *barycentre* of P_1, P_2 and P_3), such that $\overrightarrow{GP_1} + \overrightarrow{GP_2} + \overrightarrow{GP_3} = \vec{0}$. What is the relationship between the coordinates of G and those of P_1, P_2 and P_3 .
- 3) Find the parametric and implicit equations of the straight line r that goes through $(P) = (1,-2)$ and $(Q) = (2,1)$. If a reference frame R^* , with origin at P and basis formed by $\vec{u}(2,-1)$ and $\vec{v}(1,3)$, which are the equations of r with respect to R^* ?
- 4) Let $R = (O, B = \{\vec{e}_1, \vec{e}_2\})$ and $R^* = (P, B^* = \{\vec{u}_1, \vec{u}_2\})$ be reference frames such that $\vec{u}_1 = \vec{e}_1 - \vec{e}_2$ and $\vec{u}_2 = -2\vec{e}_1 + 7\vec{e}_2$ and $(O)_{R^*} = (0,1)$. Find the parametric and implicit equations of the straight line r that goes through P and $(Q)_R = (1,-1)$ with respect to R and with respect to R^* .
- 5) Let h_1 be a homothety with centre P , and h_2 be a homothety with centre Q . If X' is the image by $h_2 \circ h_1$ of X , draw the image by $h_2 \circ h_1$ of Y .



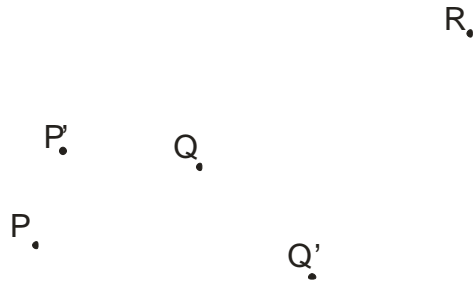
- 6) Sketch the image under $f \circ h$, of the triangle with vertices M, N and T in the figure below if
 - f : reflection with respect to the line r which takes C to C'
 - h : homothety with centre C and similitude ratio $k = -2$

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- 7) Given the three collinear points P , Q and R and the images by an affinity f , $P'=f(P)$ and $Q'=f(Q)$, in the figure below, sketch $R'=f(R)$



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