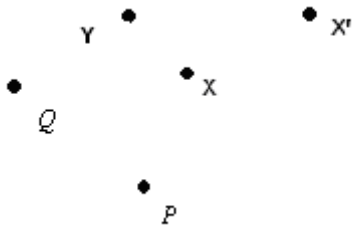
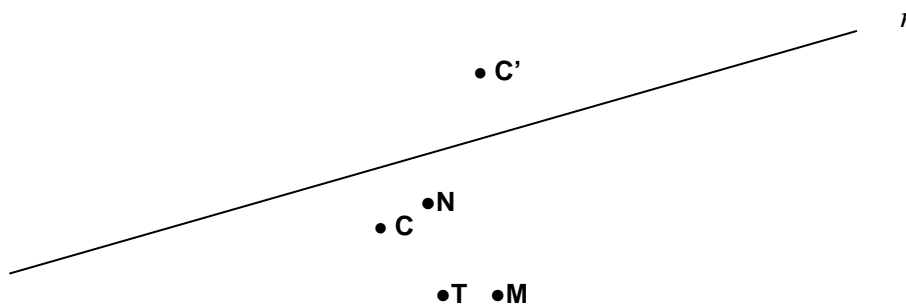


- Given the points  $P(1,-1), Q(2,0,1), R(-1,1,2)$  find the coordinates of the points X and Y such that PQRX y PQYR are parallelograms.
- Given the points  $P_1, P_2$  and  $P_3$ , check that there exists a unique point  $G$  (called *barycentre* of  $P_1, P_2$  and  $P_3$ ), such that  $\overrightarrow{GP_1} + \overrightarrow{GP_2} + \overrightarrow{GP_3} = \vec{0}$ . What is the relationship between the coordinates of  $G$  and those of  $P_1, P_2$  and  $P_3$ .
- 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  $R^*$ ?
- 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  $R^*$ .
- 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  $Y$ .



- 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  $k = -2$



- 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  $R'=f(R)$

