1) Given the points \(P(1,-1,1), Q(2,0,1), R(-1,1,2)\) 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 \(GP_1 + GP_2 + GP_3 = 0\). 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 \(u(2,-1)\) and \(v(1,3)\), which are the equations of \(r\) with respect to \(R^*\)?

4) Let \(R = (O, B = \{e_1, e_2\})\) and \(R^* = (P, B^* = \{u_1, u_2\})\) be reference frames such that \(u_1 = e_1 - e_2\) and \(u_2 = -2e_1 + 7e_2\) 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 \(k = -2\)
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 \( R' = f(R) \).