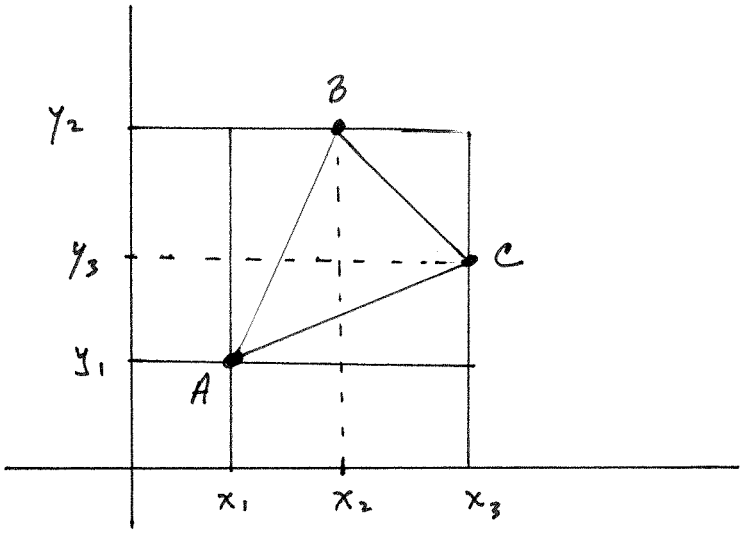

Find the area of $\triangle ABC$ given the coordinates $A(x_1, y_1)$, $B(x_2, y_2)$, $C(x_3, y_3)$.

Verify that the area of $\triangle ABC = \frac{1}{2}\left|\det\begin{bmatrix} x_1 & x_2 & x_3 \\ y_1 & y_2 & y_3 \\ 1 & 1 & 1 \end{bmatrix}\right|$.

Use that relationship to test the conjecture that the ~~three~~ medians of a triangle partition the triangle into six subtriangles of the same area.

Also, test our conjecture about the proportional partitioning of the medians by their common point of intersection.