PROOFS USING ANALYTIC GEOMETRY

By Alex Pintilie

In all the following proofs it is important

a) to maintain the generality of the proof

b) to choose wisely the system of axes

Together:

1) Prove that all the points on the perpendicular bisector of a line segment AB are equidistant from the endpoints of the segment.

2) Prove that if ABCD is a parallelogram (AB || CD and AD || BC) then its diagonals bisect each other.

3) Prove that in any triangle ABC, the medians are concurrent.

Homework:

1) Prove that when connecting the midpoints of the sides of any quadrilateral one obtains a parallelogram.

2) Prove that if in a quadrilateral ABCD the diagonals bisect each other than the quadrilateral is a parallelogram. (Hint: Choose the intersection of the diagonals as the origin of the axes.)

3) Prove that in any triangle ABC the altitudes are concurrent.
(Hint: Choose A(a,0), B(0,b), C (c,0).)

4) Prove that in any triangle ABC, the perpendicular bisectors of the sides are concurrent.