E1-24 Solubility of some geometric problems in mathematics

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We take a sheet of paper in the form of a rectangle or a square as a model of the Euclidean plane for constructions.

Def. A line in our plane is a crease created by a finite sequence of the following folding methods: *Methods of folding:* (1) We are allowed to fold the paper through any two different points; (2) We are allowed to match a point to another different point; (3) We are allowed to fold the paper such that two different points are placed on the two different non parallel lines; (4) We are allowed to fold the paper through a line on the paper or a line on the folded paper; (5) We are allowed one line to match onto another line.

Axioms: (1) There exist unique lines (creases) by the above 5 methods; (2) The intersection of 2 non parallel lines is a point; (3) Through any 2 different points there is only one line, (4) The crease created by matching one point onto another point is the perpendicular bisector of the line segment joining those points; (5) By matching one line to another non parallel line the creating crease is the angle bisector of these lines, If the original lines were parallel then the crease is the equidistant line; (6) By folding through a line and again by folding the folded part of the paper through a second line creates a crease which is the mirror image of the second line on the first line.

It is not difficult to prove the following *propositions:* 1. The constructibility of the right triangle with hypotenuse $(2+(2)^{1/2})^{1/2}$ a and leg a is soluble. The trisection of any angle is soluble.