Study Note—Euclid's *Elements*, Book I, Proposition 25

David R. Wilkins

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To establish this proposition we must show that, if we are given two triangles ABC and DEF, in which

AB = DE and AC = DF.

and if BC is longer than EF, then the angle BAC of the first triangle at the vertex A is larger than the angle EDF of the second triangle at the vertex D.



If the angles BAC and EDF were equal then it would follow from the SAS Congruence Rule (Proposition 4 of Book I of Euclid's *Elements of Geometry*) that the sides BC and EF would be equal. But this is not the case.

If the angle EDF were larger than the angle BAC then it would follow from Proposition 24 of Book I of Euclid's *Elements of Geometry* that the side EF would be larger than the side BC. But this is not the case.

Consequently the angle BAC of the triangle ABC at the vertex A must be larger than the angle EDF of the triangle DEF at the vertex D, as required.