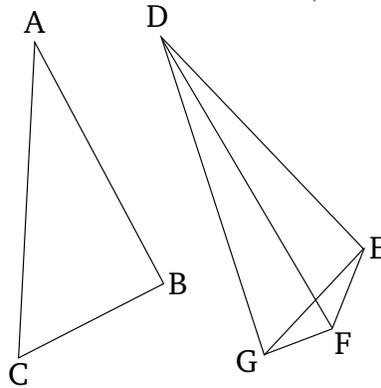


Book 1

Proposition 24

If two triangles have two sides equal to two sides, respectively, but (one) has the angle encompassed by the equal straight-lines greater than the (corresponding) angle (in the other), then (the former triangle) will also have a base greater than the base (of the latter).



Let ABC and DEF be two triangles having the two sides AB and AC equal to the two sides DE and DF , respectively. (That is), AB (equal) to DE , and AC to DF . Let them also have the angle at A greater than the angle at D . I say that the base BC is also greater than the base EF .

For since angle BAC is greater than angle EDF , let (angle) EDG , equal to angle BAC , have been constructed at the point D on the straight-line DE [Prop. 1.23]. And let DG be made equal to either of AC or DF [Prop. 1.3], and let EG and FG have been joined.

Therefore, since AB is equal to DE and AC to DG , the two (straight-lines) BA , AC are equal to the two (straight-lines) ED , DG , respectively. Also the angle

BAC is equal to the angle EDG . Thus, the base BC is equal to the base EG [Prop. 1.4]. Again, since DF is equal to DG , angle DGF is also equal to angle DFG [Prop. 1.5]. Thus, DFG (is) greater than EGF . Thus, EFG is much greater than EGF . And since triangle EFG has angle EFG greater than EGF , and the greater angle is subtended by the greater side [Prop. 1.19], side EG (is) thus also greater than EF . But EG (is) equal to BC . Thus, BC (is) also greater than EF .

Thus, if two triangles have two sides equal to two sides, respectively, but (one) has the angle encompassed by the equal straight-lines greater than the (corresponding) angle (in the other), then (the former triangle) will also have a base greater than the base (of the latter). (Which is) the very thing it was required to show.