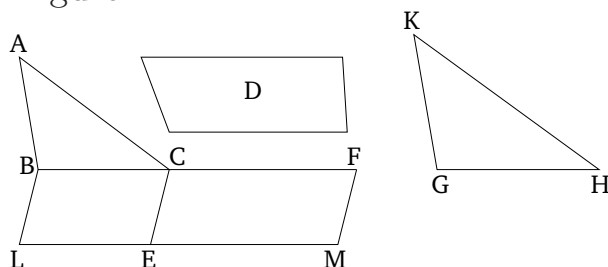


Book 6

Proposition 25

To construct a single (rectilinear figure) similar to a given rectilinear figure, and equal to a different given rectilinear figure.



Let ABC be the given rectilinear figure to which it is required to construct a similar (rectilinear figure), and D the (rectilinear figure) to which (the constructed figure) is required (to be) equal. So it is required to construct a single (rectilinear figure) similar to ABC , and equal to D .

For let the parallelogram BE , equal to triangle ABC , have been applied to (the straight-line) BC [Prop. 1.44], and the parallelogram CM , equal to D , (have been applied) to (the straight-line) CE , in the angle FCE , which is equal to CBL [Prop. 1.45]. Thus, BC is straight-on to CF , and LE to EM [Prop. 1.14]. And let the mean proportion GH have been taken of BC and CF [Prop. 6.13]. And let KGH , similar, and similarly laid out, to ABC have been described on GH [Prop. 6.18].

And since as BC is to GH , so GH (is) to CF , and if three straight-lines are proportional then as the first is to the third, so the figure (described) on the first (is)

to the similar, and similarly described, (figure) on the second [Prop. 6.19 corr.], thus as BC is to CF , so triangle ABC (is) to triangle KGH . But, also, as BC (is) to CF , so parallelogram BE (is) to parallelogram EF [Prop. 6.1]. And, thus, as triangle ABC (is) to triangle KGH , so parallelogram BE (is) to parallelogram EF . Thus, alternately, as triangle ABC (is) to parallelogram BE , so triangle KGH (is) to parallelogram EF [Prop. 5.16]. And triangle ABC (is) equal to parallelogram BE . Thus, triangle KGH (is) also equal to parallelogram EF . But, parallelogram EF is equal to D . Thus, KGH is also equal to D . And KGH is also similar to ABC .

Thus, a single (rectilinear figure) KGH has been constructed (which is) similar to the given rectilinear figure ABC , and equal to a different given (rectilinear figure) D . (Which is) the very thing it was required to do.