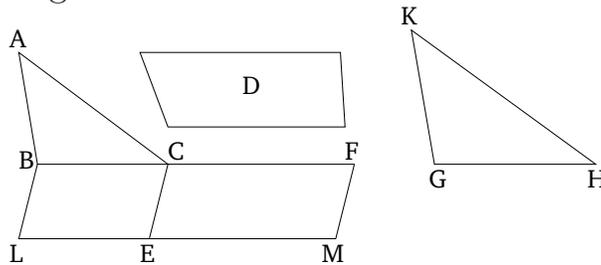


# Book 6

## 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.