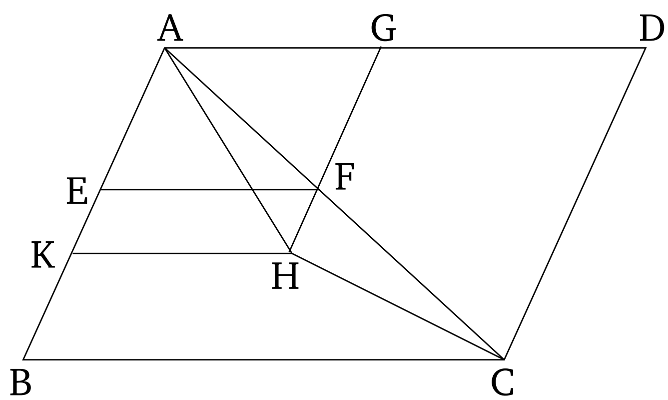
Book 6
Proposition 26

If from a parallelogram a(nother) parallelogram is subtracted (which is) similar, and similarly laid out, to the whole, having a common angle with it, then (the subtracted parallelogram) is about the same diagonal as the whole.

For, from parallelogram $ABCD$, let (parallelogram) AF have been subtracted (which is) similar, and similarly laid out, to $ABCD$, having the common angle DAB with it. I say that $ABCD$ is about the same diagonal as AF.



For (if) not, then, if possible, let AHC be [$ABCD$'s] diagonal. And producing GF, let it have been drawn through to (point) H. And let HK have been drawn through (point) H, parallel to either of AD or BC [Prop. 1.31].

Therefore, since $ABCD$ is about the same diagonal as KG, thus as DA is to AB, so GA (is) to AK [Prop. 6.24]. And, on account of the similarity of $ABCD$ and EG, also, as DA (is) to AB, so GA (is) to AE. Thus, also, as GA (is) to AK, so GA (is) to AE. Thus, GA has the same ratio to each of AK and AE. Thus, AE is equal to AK [Prop. 5.9], the lesser to the greater. The very thing is impossible. Thus, $ABCD$ is not not about the same diagonal as AF. Thus, parallelogram $ABCD$ is about the same diagonal as parallelogram AF.

Thus, if from a parallelogram a(nother) parallelogram is subtracted (which is) similar, and similarly laid out, to the whole, having a common angle with it, then (the subtracted parallelogram) is about the same diagonal as the whole. (Which is) the very thing it was required to show.