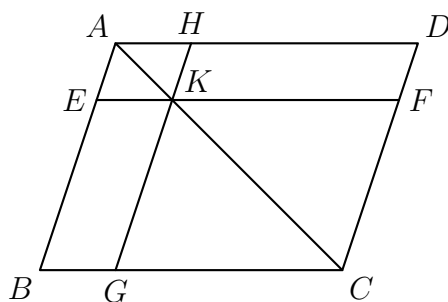


Study Note—Euclid’s *Elements*, Book I, Proposition 43

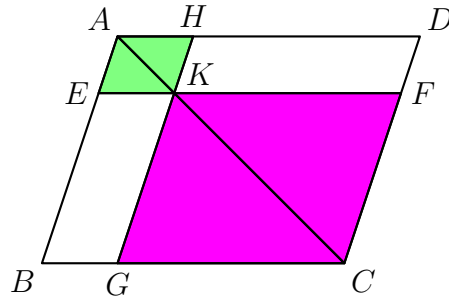
David R. Wilkins

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Let $ABCD$ be a parallelogram, let K be a point lying on the diagonal AC of that parallelogram, let EF be drawn through K parallel to AD from a point E on AB to a point F on CD , and let HG be drawn through K parallel to AB from a point H on AD to a point G on BC . We must prove that the ‘complements’ $EBGK$ and $HKFD$ are equal in area to one another.



Now it follows from Proposition 34 of Book I of Euclid's *Elements of Geometry* that the large triangles ABC and ADC are equal in area. Also the small triangles AEK and KGC contained within the lower left large triangle ABC are respectively equal in area to the small triangles AHK and KFC contained within the upper right large triangle ADC .



Applying Common Notion 3, we conclude that the parallelogram $EBGK$ obtained on subtracting the small triangles AEK and KGC from the lower left large triangle ABC is equal in area to the parallelogram $HKFD$ obtained on subtracting the small triangles AHK and KFC from the upper right large triangle ADC , as required.

