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Generalization of Pythagoras

1 Problem

“In the triangle ABC let any parallelograms $ABED$, $BCFG$ be drawn on AB , AC and let DE , FG meet in H . Join HB and produce it to meet AC in K . The sum of the parallelograms $ABED$, $BCFG$ can then be shown to be equal to the parallelogram contained by AC , HB in an angle equal to the sum of the angles BAC , DHB .” [1, Book IV]

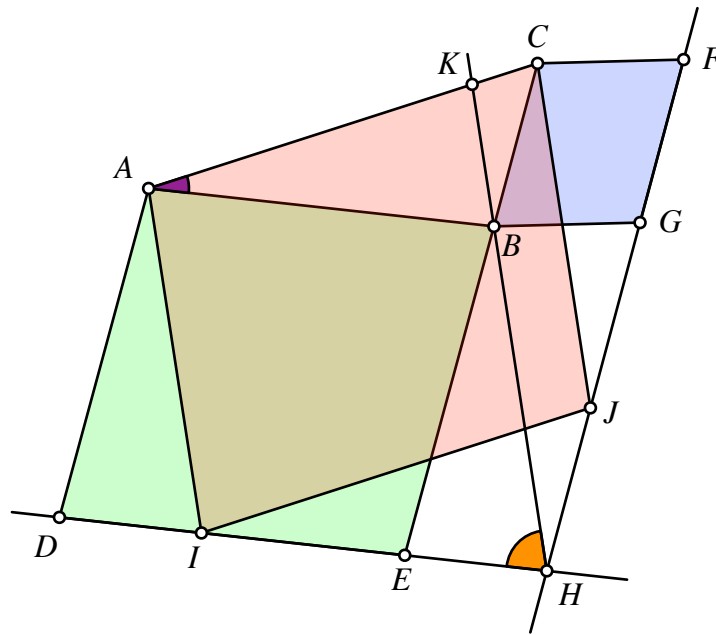


Fig. 0: Red = Green + Blue

2 Proof without words

(using the principle of Cavalieri)

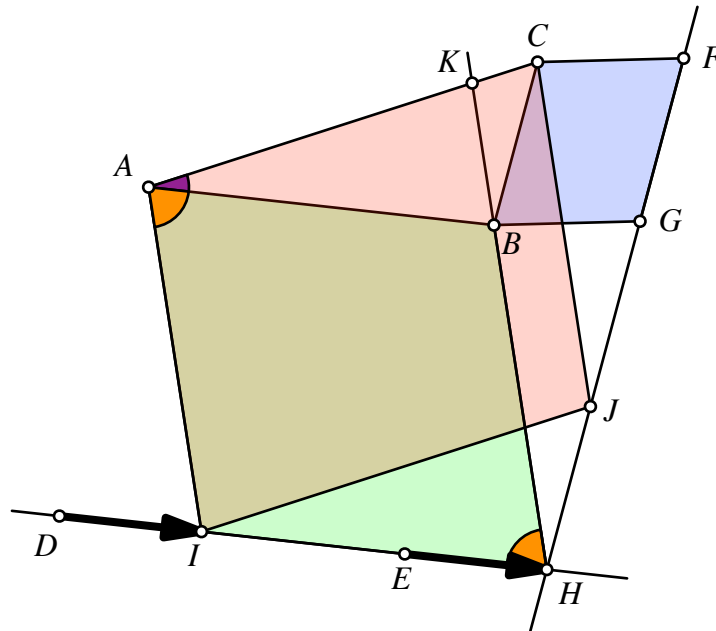


Fig. 1: First step

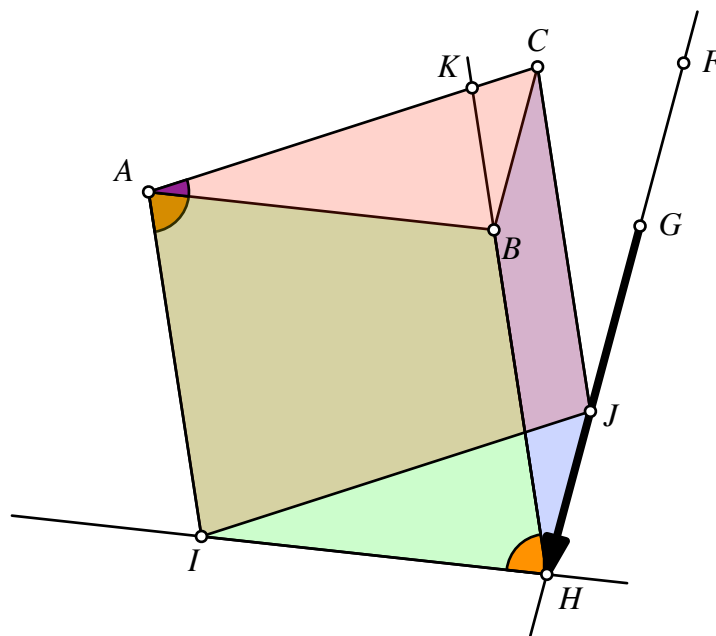


Fig. 2: Second step

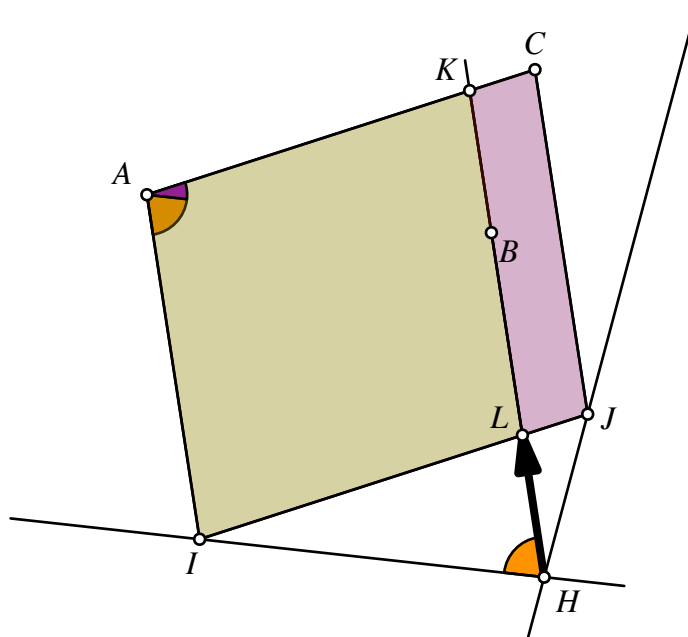


Fig. 3: Third step

References

- [1] <http://www.encyclopedia.com/science/dictionaries-thesauruses-pictures-and-press-releases/pappus-alexandria>