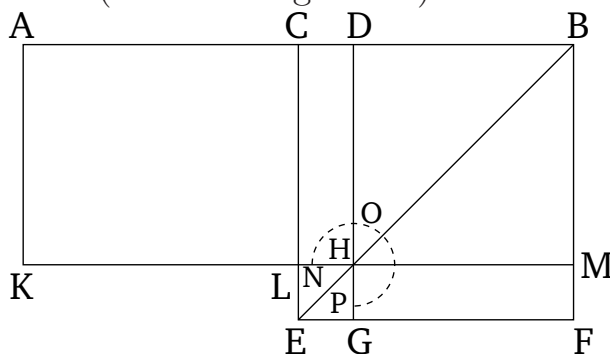


Book 2

Proposition 5

If a straight-line is cut into equal and unequal (pieces) then the rectangle contained by the unequal pieces of the whole (straight-line), plus the square on the (difference) between the (equal and unequal) pieces, is equal to the square on half (of the straight-line).



For let any straight-line AB have been cut—equally at C , and unequally at D . I say that the rectangle contained by AD and DB , plus the square on CD , is equal to the square on CB .

For let the square $CEFB$ have been described on CB [Prop. 1.46], and let BE have been joined, and let DG have been drawn through D , parallel to either of CE or BF [Prop. 1.31], and again let KM have been drawn through H , parallel to either of AB or EF [Prop. 1.31], and again let AK have been drawn through A , parallel to either of CL or BM [Prop. 1.31]. And since the complement CH is equal to the complement HF [Prop. 1.43], let the (square) DM have been added to both. Thus, the whole (rectangle) CM is equal to the whole (rectangle) DF . But, (rectangle) CM is equal to (rectangle)

AL , since AC is also equal to CB [Prop. 1.36]. Thus, (rectangle) AL is also equal to (rectangle) DF . Let (rectangle) CH have been added to both. Thus, the whole (rectangle) AH is equal to the gnomon NOP . But, AH is the (rectangle contained) by AD and DB . For DH (is) equal to DB . Thus, the gnomon NOP is also equal to the (rectangle contained) by AD and DB . Let LG , which is equal to the (square) on CD , have been added to both. Thus, the gnomon NOP and the (square) LG are equal to the rectangle contained by AD and DB , and the square on CD . But, the gnomon NOP and the (square) LG is (equivalent to) the whole square $CEFB$, which is on CB . Thus, the rectangle contained by AD and DB , plus the square on CD , is equal to the square on CB .

Thus, if a straight-line is cut into equal and unequal (pieces) then the rectangle contained by the unequal pieces of the whole (straight-line), plus the square on the (difference) between the (equal and unequal) pieces, is equal to the square on half (of the straight-line). (Which is) the very thing it was required to show.