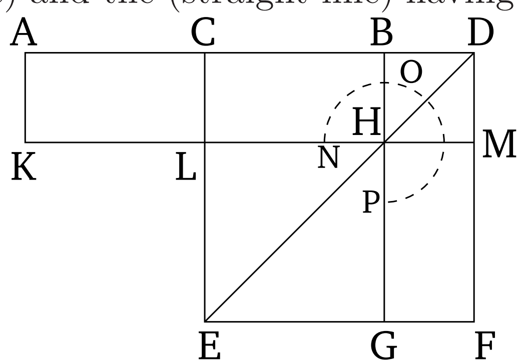
Book 2
Proposition 6

If a straight-line is cut in half, and any straight-line added to it straight-on, then the rectangle contained by the whole (straight-line) with the (straight-line) having being added, and the (straight-line) having being added, plus the square on half (of the original straight-line), is equal to the square on the sum of half (of the original straight-line) and the (straight-line) having been added.



For let any straight-line AB have been cut in half at point C, and let any straight-line BD have been added to it straight-on. I say that the rectangle contained by AD and DB, plus the square on CB, is equal to the square on CD.

For let the square $CEFD$ have been described on CD [Prop. 1.46], and let DE have been joined, and let BG have been drawn through point B, parallel to either of EC or DF [Prop. 1.31], and let KM have been drawn through point H, parallel to either of AB or EF [Prop. 1.31], and finally let AK have been drawn through A, parallel to either of CL or DM [Prop. 1.31].

Therefore, since AC is equal to CB, (rectangle) AL is also equal to (rectangle) CH [Prop. 1.36]. But, (rectangle) CH is equal to (rectangle) HF [Prop. 1.43]. Thus, (rectangle) AL is also equal to (rectangle) HF. Let (rectangle) CM have been added to both. Thus, the whole (rectangle) AM is equal to the gnomon NOP. But, AM is the (rectangle contained) by AD and DB. For DM is equal to DB. Thus, gnomon NOP is also equal to the [rectangle contained] by AD and DB. Let LG, which is equal to the square on BC, have been added to both. Thus, the rectangle contained by AD and DB, plus the square on CB, is equal to the gnomon NOP and the (square) LG. But the gnomon NOP and the (square) LG is (equivalent to) the whole square $CEFD$, which is on CD. Thus, the rectangle contained by AD and DB, plus the square on CB, is equal to the square on CD.

Thus, if a straight-line is cut in half, and any straight-line added to it straight-on, then the rectangle contained by the whole (straight-line) with the (straight-line) having being added, and the (straight-line) having being added, plus the square on half (of the original straight-line), is equal to the square on the sum of half (of the original straight-line) and the (straight-line) having been added. (Which is) the very thing it was required to show.