

Book 10

Proposition 37

If two medial (straight-lines), commensurable in square only, which contain a rational (area), are added together then the whole (straight-line) is irrational—let it be called a first bimedral (straight-line).[†]



For let the two medial (straight-lines), AB and BC , commensurable in square only, (and) containing a rational (area), be laid down together. I say that the whole (straight-line), AC , is irrational.

For since AB is incommensurable in length with BC , (the sum of) the (squares) on AB and BC is thus also incommensurable with twice the (rectangle contained) by AB and BC [see previous proposition]. And, via composition, (the sum of) the (squares) on AB and BC , plus twice the (rectangle contained) by AB and BC —that is, the (square) on AC [Prop. 2.4]—is incommensurable with the (rectangle contained) by AB and BC [Prop. 10.16]. And the (rectangle contained) by AB and BC (is) rational—for AB and BC were assumed to enclose a rational (area). Thus, the (square) on AC (is) irrational. Thus, AC (is) irrational [Def. 10.4]—let it be called a first bimedral (straight-line).[‡] (Which is) the very thing it was required to show.