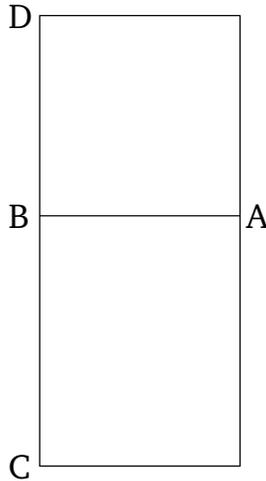


Book 10

Proposition 20

If a rational (area) is applied to a rational (straight-line) then it produces as breadth a (straight-line which is) rational, and commensurable in length with the (straight-line) to which it is applied.



For let the rational (area) AC have been applied to the rational (straight-line) AB , producing the (straight-line) BC as breadth. I say that BC is rational, and commensurable in length with BA .

For let the square AD have been described on AB . AD is thus rational [Def. 10.4]. And AC (is) also rational. DA is thus commensurable with AC . And as DA is to AC , so DB (is) to BC [Prop. 6.1]. Thus, DB is also commensurable (in length) with BC [Prop. 10.11]. And DB (is) equal to BA . Thus, AB (is) also commensurable (in length) with BC . And AB is rational. Thus, BC is also rational, and commensurable in length with AB [Def. 10.3].

Thus, if a rational (area) is applied to a rational (straight-line), and so on