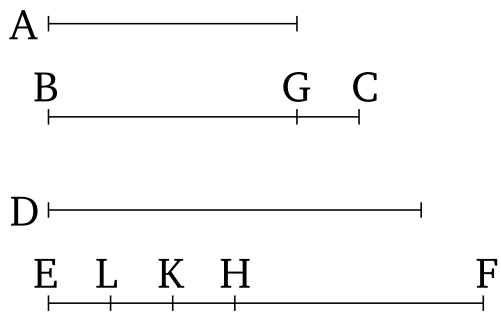
Book 9
Proposition 35

If there is any multitude whatsoever of continually proportional numbers, and (numbers) equal to the first are subtracted from (both) the second and the last, then as the excess of the second (number is) to the first, so the excess of the last will be to (the sum of) all those (numbers) before it.



Let A, BC, D, EF be any multitude whatsoever of continuously proportional numbers, beginning from the least A. And let BG and FH, each equal to A, have been subtracted from BC and EF (respectively). I say that as GC is to A, so EH is to A, BC, D.

For let FK be made equal to BC, and FL to D. And since FK is equal to BC, of which FH is equal to BG, the remainder HK is thus equal to the remainder GC. And since as EF is to D, so D (is) to BC, and BC to A [Prop. 7.13], and D (is) equal to FL, and BC to FK, and A to FH, thus as EF is to FL, so LF (is) to FK, and FK to FH. By separation, as EL (is) to LF, so LK (is) to FK, and KH to FH [Props. 7.11, 7.13]. And thus as one of the leading (numbers) is to one of the following, so (the sum of) all of the leading (numbers is) to (the sum of) all of the following [Prop. 7.12]. Thus, as KH is to FH, so EL, LK, KH (are) to LF, FK, HF. And KH (is) equal to CG, and FH to A, and LF, FK, HF to D, BC, A. Thus, as CG is to A, so EH (is) to D, BC, A. Thus, as the excess of the second (number) is to the first, so the excess of the last (is) to (the sum of) all those (numbers) before it. (Which is) the very thing it was required to show.