

## Book 5

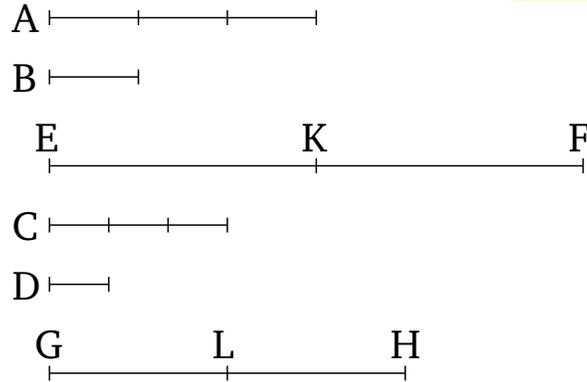
### Proposition 3

If a first (magnitude) and a third are equal multiples of a second and a fourth (respectively), and equal multiples are taken of the first and the third, then, via equality, the (magnitudes) taken will also be equal multiples of the second (magnitude) and the fourth, respectively.

For let a first (magnitude)  $A$  and a third  $C$  be equal multiples of a second  $B$  and a fourth  $D$  (respectively), and let the equal multiples  $EF$  and  $GH$  have been taken of  $A$  and  $C$  (respectively). I say that  $EF$  and  $GH$  are equal multiples of  $B$  and  $D$  (respectively).

For since  $EF$  and  $GH$  are equal multiples of  $A$  and  $C$  (respectively), thus as many (magnitudes) as (there) are in  $EF$  equal to  $A$ , so many (are there) also in  $GH$  equal to  $C$ . Let  $EF$  have been divided into magnitudes  $EK$ ,  $KF$  equal to  $A$ , and  $GH$  into (magnitudes)  $GL$ ,  $LH$  equal to  $C$ . So, the number of (magnitudes)  $EK$ ,  $KF$  will be equal to the number of (magnitudes)  $GL$ ,  $LH$ . And since  $A$  and  $C$  are equal multiples of  $B$  and  $D$  (respectively), and  $EK$  (is) equal to  $A$ , and  $GL$  to  $C$ ,  $EK$  and  $GL$  are thus equal multiples of  $B$  and  $D$  (respectively). So, for the same (reasons),  $KF$  and  $LH$  are equal multiples of  $B$  and  $D$  (respectively). Therefore, since the first (magnitude)  $EK$  and the third  $GL$  are equal multiples of the second  $B$  and the fourth  $D$  (respectively), and the fifth (magnitude)  $KF$  and the sixth  $LH$  are also equal multiples of the second  $B$  and the fourth  $D$  (respectively), then the first (magnitude) and fifth, being added together, (to give)  $EF$ , and the third

(magnitude) and sixth, (being added together, to give)  $GH$ , are thus also equal multiples of the second (magnitude)  $B$  and the fourth  $D$  (respectively) [Prop. 5.2].



Thus, if a first (magnitude) and a third are equal multiples of a second and a fourth (respectively), and equal multiples are taken of the first and the third, then, via equality, the (magnitudes) taken will also be equal multiples of the second (magnitude) and the fourth, respectively. (Which is) the very thing it was required to show.