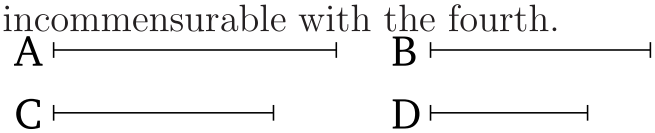
Book 10
Proposition 11

If four magnitudes are proportional, and the first is commensurable with the second, then the third will also be commensurable with the fourth. And if the first is incommensurable with the second, then the third will also be incommensurable with the fourth.



Let A, B, C, D be four proportional magnitudes, (such that) as A (is) to B, so C (is) to D. And let A be commensurable with B. I say that C will also be commensurable with D.

For since A is commensurable with B, A thus has to B the ratio which (some) number (has) to (some) number [Prop. 10.5]. And as A is to B, so C (is) to D. Thus, C also has to D the ratio which (some) number (has) to (some) number. Thus, C is commensurable with D [Prop. 10.6].

And so let A be incommensurable with B. I say that C will also be incommensurable with D. For since A is incommensurable with B, A thus does not have to B the ratio which (some) number (has) to (some) number [Prop. 10.7]. And as A is to B, so C (is) to D. Thus, C does not have to D the ratio which (some) number (has) to (some) number either. Thus, C is incommensurable with D [Prop. 10.8].

Thus, if four magnitudes, and so on ....