

MT 453 Elements Day 26

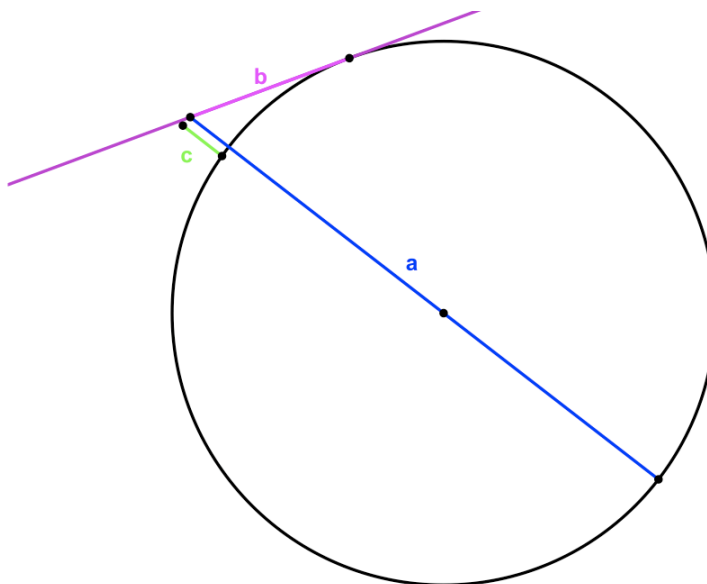
Speaker: Thomas Quan

Scribes: Kaitlyn Valente, Richard Embser

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Definitions V.8, V.9, and V.10

*Definition V.8: A proportion has at least three terms (magnitudes).
The smallest way to write a proportion is $a:b = b:c$ since $a:b = b:a$ is trivial.*



This proportion was first seen in Proposition III.36, which shows that $ac = b^2$. If we divide both sides by c and b , we get the proportion: $a:b = b:c$.

*Definition V.9: When three magnitudes are proportional, then the ratio of the first to the third is the **duplicate ratio** of the first to the second.*

This means that if $a:b = b:c$, then $a:c = b^2:c^2$.

We start with the ratio $\frac{a}{b} = \frac{b}{c}$. If you multiply both sides by b and divide both sides by c , we get $\frac{ab}{bc} = \frac{b^2}{c^2}$.

Definition V.10: When four magnitudes are proportional the ratio of the first to the fourth is the triplicate ratio of the first to the second.

This means that if $a:b = b:c = c:d$, then $a:d = c^2:d^2$