

Problem : Cross-Country Circus - Solution

Draw radii from the centers A and B to the intersections of the tightrope with the borders as in Figure 1. By opposite angles we have $\angle ACD = \angle BCE = \theta$, and as $|AC| = |AD| = a$ and $|BC| = |BE| = b$, the triangles $\triangle ACD$ and $\triangle BCE$ are equilateral and therefore similar. In particular, we have $\frac{|DC|}{|EC|} = \frac{|AC|}{|BC|} = \frac{a}{b}$. It follows that the fraction of the length $|DE|$ in Abyssnia is $\frac{a}{a+b}$.

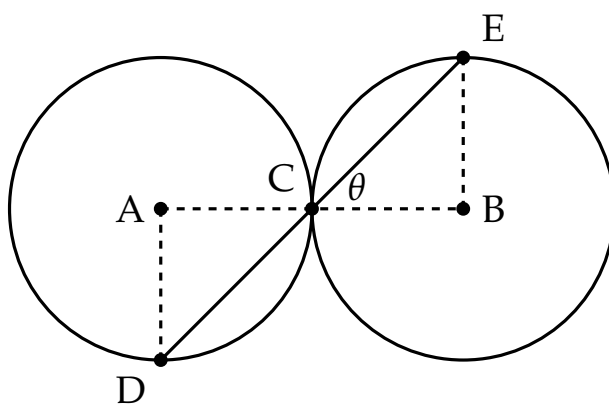


Figure 1: Similar triangles.