Name: _____

Math Club: Contest Week Six

Release Date: April 19, 2023
Instructions: Solve the following problem the best you can, first to submit the correct solution via email or the secretaries in Room 332 (with time stamp) wins!

Problem 1. Fill out the side-length of every member in the below diagram to prove that given $\theta_\alpha = \arctan(\alpha)$ and $\theta_\beta = \arctan(\beta)$ respectively, it follows that

$$\theta_\alpha + \theta_\beta = \arctan(\alpha) + \arctan(\beta) = \arctan\left(\frac{\alpha+\beta}{1-\alpha\beta}\right).$$

Some angles and sides have already been filled in for clarity,