Math Club: Contest Week Three
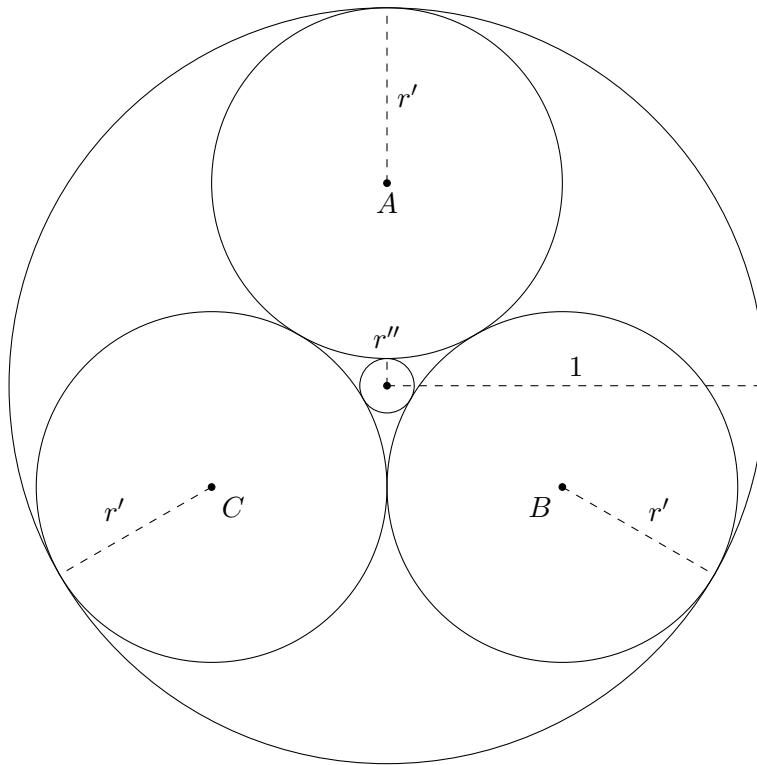
Release Date: February 22, 2023
Instructions: Solve the following problem the best you can, first to submit the correct solution via email or the secretaries in Room 332 (with time stamp) wins!

Problem 1. A circle of radius 1 is centered at the origin. Three circles of radius r' centered at A, B, and C respectively, are constructed inside the radius 1 circle such that there are all tangent to each other and to the radius 1 circle. A smaller, radius r'' circle, is centered at the center of the radius 1 circle such that it is tangent to every radius r' circle. This construction is shown below.

r'

A

r''

1

r' C

B r'

What is r''?