

Name: \_\_\_\_\_  
Email: \_\_\_\_\_

**Math Club: Biweekly Contest Week One**

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**Release Date:** August 30, 2023

**Instructions:** Solve the following problem as best you can. The first student to submit the correct solution via email to tamumathcontest@gmail.com or to Jeremy Kubiak in Blocker 336D (with time stamp) wins!

**Problem 1.** Place two points  $A$  and  $B$  such that  $|\overline{AB}| = 1$ . Now trisect the segment  $\overline{AB}$  to create points  $P$  and  $Q$ . Draw the following three circles:

1. A circle of radius  $1/3$  centered at  $A$ ,
2. A circle of radius  $2/3$  centered at  $B$ ,
3. A circle of radius  $1$  centered at  $Q$ .

A fourth circle; centered at a point  $C$ , can be drawn such that it is externally tangent to the circles centered at  $A$  and  $B$  and internally tangent to the circle centered at  $Q$ .

After this construction; fill in the shaded areas as shown. What fraction of the circle centered at  $Q$  is shaded?

