Problem 6 (due Monday, November 17)

Prove that for $\alpha\in (0,\pi/2)$ we have \[\tan(\alpha)-\tan\left(\frac{\alpha}{2}\right)+\tan\left(\frac{\alpha}{4}\right)-\tan\left(\frac{\alpha}{8}\right)+\ldots\geq \tan\left(\frac{2\alpha}{3}\right).\]

We received solutions from Gerald Marchesi, Trinidad Segovia (a freshman student at Purdue University), and Mathew Wolak. Two of the solvers submitted correct solutions, and their solutions were different from our in-house solutions. For details and some generalization see the following link Solution.