

Problem of the Month, January 2009

Please turn all solutions into Dr. Dunn's office, JB 322. You may slide your solutions under his door as well. Most elegant solution wins a \$10 gift certificate to the bookstore! Solutions will be accepted anytime during the month of January, 2009. Good luck!

Let S_1 be a square of side length 2. Inscribe a circle of maximal area into S_1 , and inside of that circle inscribe a square S_2 of maximal area. Inscribe a circle of maximal area inside S_2 , and then inscribe a square S_3 inside of that circle. Continuing this process, we get a sequence of (nested) squares S_1, S_2, \dots . Let $A(S_k)$ be the area of the square S_k . Compute $\sum_{k=1}^{\infty} A(S_k)$.