

Problem of the week #1

Due January 31st [extended from 24th]

The *isoperimetric quotient* of a simple closed loop in the plane is the ratio A/P^2 , where A is the area enclosed and P the perimeter. It is maximized only when the loop is as symmetric as possible, i.e. a perfect circle. Among rectangles, squares have maximal quotient.

Consider the *isoeperial ratio* V^2/S^3 for closed surfaces in three dimensions, where V is the volume enclosed and S the surface area.

Problem. Prove cubes have maximal isoeperial ratio among cuboids.

(A cuboid is a right rectangular prism, i.e. ... a box.)

- Partial credit may be given for partial answers.
- Each POW will be due the following week at 1pm.
- Questions? Email: bthorner@unomaha.edu
- Submit solutions to (above email), DSC 210, or DSC 203.
- POWs, solutions, backgrounds, leaderboard available at

https://www.unomaha.edu/college-of-arts-and-sciences/mathematics/student-opportunities/pow_solutions.php