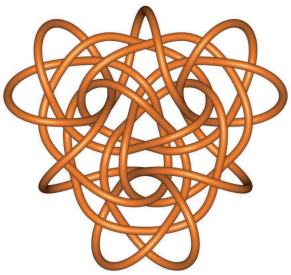
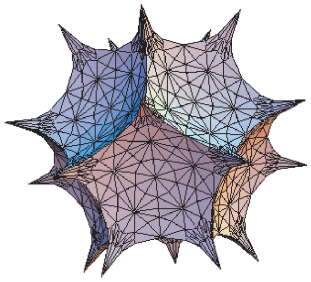
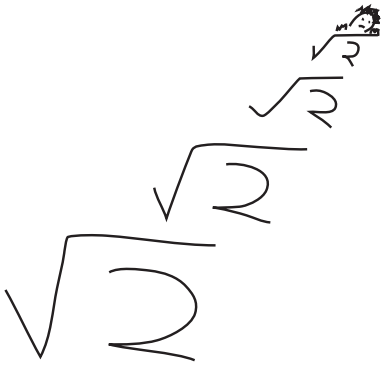


Willamette Math Problem of the Week



October 22 2007
Tower of Irrationality

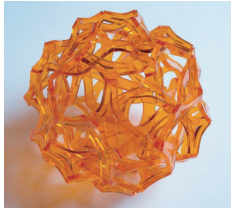


Find with justification $\sqrt{2}^{\sqrt{2}^{\sqrt{2}^{\cdot^{\cdot^{\cdot}}}}}$.

Submit all solutions before the appearance of the next problem to Josh Laison in person, by e-mail (jlaison@willamette.edu), or by stone tablet. The first correct solution gets a prize; all correct solutions get fame and glory. Preference for the prize goes to problem-solvers who haven't won one yet.

Solution to *Eats at the Round Table*:
Congratulations to **Charlie Mathes**, who solved the problem first and won a four-pack of Play-Doh, and to **Jason Ames**, who also submitted a correct solution.
The smallest number of seating arrangements needed is 4. Note first that the number of pairs of people needed to sit next to each other is $\binom{8}{2} = 28$. Since each seating arrangement sits 8 pairs of people next to each other, at least $\lceil 28/8 \rceil = 4$ seating arrangements are required. So all we have to do is find four seating arrangements that work. If we label the people 1 through 8, the following four arrangements, due to Jason Ames, work (thinking of the people sitting at a round table, so the first and last people are also sitting next to each other).

12345678, 15374826, 31427586, 17253846



Past problems of the week, solutions, and solvers can be found at http://www.willamette.edu/~jlaison/problem.html