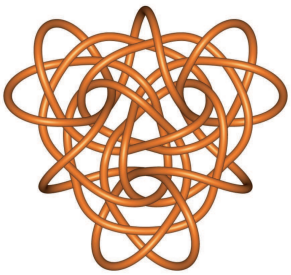
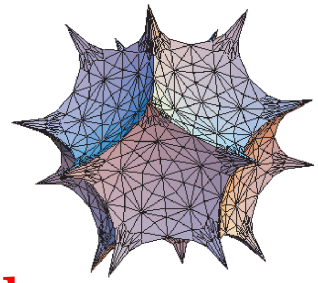


Willamette Math Problem of the Week



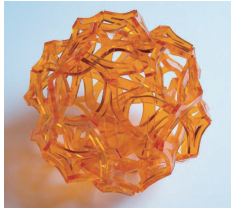
October 8 2007

Eats at the Round Table

Eight people are having a dinner party at a large circular table. They want to change seats enough times so that everyone gets to sit next to everyone else. What's the smallest number of seating arrangements this will take?

Submit all solutions before the appearance of the next problem to Josh Laison in person, by e-mail (jlaison@willamette.edu), or by pony express. 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 *Die Roll*:
Congratulations to **John Nielsen**, who solved the problem and won a "Fifth Chair" puzzle.
We separate "rolling all six numbers" into six distinct occurrences of the event, "rolling a number we haven't seen before." The probabilities of each of these events occurring are 6/6, 5/6, 4/6, 3/6, 2/6, and 1/6. In each case we want the average number of times we need to roll the die before we get one success, which is the expected value of the geometric distribution, or 6/6, 6/5, 6/4, 6/3, 6/2, and 6/1. The average number of rolls it takes for all of these events to happen one after the other is $6/6 + 6/5 + 6/4 + 6/3 + 6/2 + 6/1 = 14.7$.



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