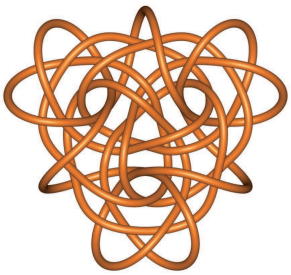
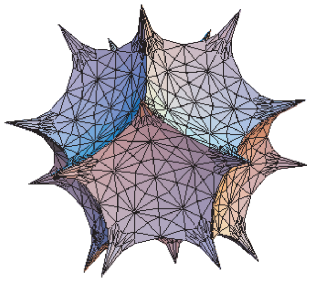
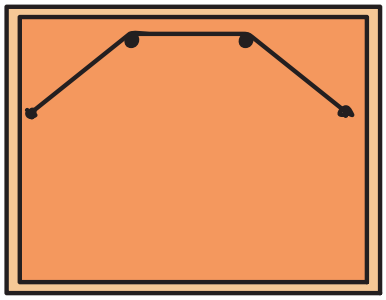


Willamette Math Problem of the Week



January 14 2008

The Precarious Picture



The standard way to hang a picture on two nails is shown here. If you remove either of the nails, the picture still hangs (perhaps lopsided) on the remaining nail. Describe a way to loop the picture wire through the nails so that if either nail is removed, the picture falls.

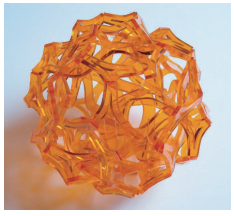
This problem is in honor of Professor Inga Johnson's Senior Seminar course in Knot Theory, but don't worry, no technical knowledge is needed to solve it.

Submit all solutions before the appearance of the next problem to Josh Laison in person, by e-mail (jlaison@willamette.edu), or by time capsule. 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 *Deterministic Poker*:
Congratulations to **Keith Hart**, who solved the problem and won a mini fez hat.

If Brandi gets to draw a royal flush (ace, king, queen, jack, 10 in the same suit) she will win, since Brandi wins in the case of a tie and Anton cannot make a better hand. So in his first draw Anton must draw one card in each of the four royal flushes. But Brandi can still make a straight flush, so Anton must give himself the option to make a higher straight flush.

He can do this by drawing four 10's, and any other fifth card. Brandi cannot now make a royal flush, and to prevent Anton making a royal flush she must draw one card higher than 10 in each of the four suits. Now the best hand that Brandi can make is a 9-high straight flush, but she cannot prevent Anton from making a 10-high straight flush, so Anton wins.



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