

Problem of the Week

Problem #2: 26. September 2014 to 03. October 2014

I have some thin wooden sticks of arbitrary and unknown lengths. I want you to make a specified polygon from these segments by connecting their ends, and you are allowed to break some of the sticks into two or more smaller pieces. In some cases you may need to make no breaks, but in others you may need to make several breaks.

Suppose I tell you how many sticks I have and the shape I want you to make, but I do not tell you their lengths. What is the minimum necessary number of breaks you must make to create the specified figure? In each case, give an example that shows that the specified number of breaks is necessary.

- Create an *equilateral triangle* from 3 sticks of wood of arbitrary length.
- Create a *rectangle* from 4 sticks of wood of arbitrary length.
- Create a *square* from 4 sticks of wood of arbitrary length.

*Direct any questions to
Gregory Galperin, OM 3361
or David Cook II, OM 3216*

Rules & Rewards

- Any undergraduate currently enrolled at EIU is eligible to participate.
- Each solution is to be the work of one individual and is to be submitted with the solver's name, year in school, email address, local address, and home address.
- Each solution is to be written or typed and is due in the main Mathematics Department office (OM 3611) by 2:00pm, Friday, 03. October 2014.
- Entries will be judged on the basis of clarity of exposition and elegance of the solution. That is to say, the *explanation* is more important than the answer.
- An award of \$20 will be given for the best solution. In the case of a two-way tie, the award will be evenly split. If there are more than two 'best' solutions, a drawing will be held for the award. In the case no award is made for this week's challenge, \$20 will be added to the next week's award.
- Names of all solvers will be posted on the Challenge of the Week bulletin board and on the Challenge of the week homepage: <http://www.eiu.edu/math/challenge.php>