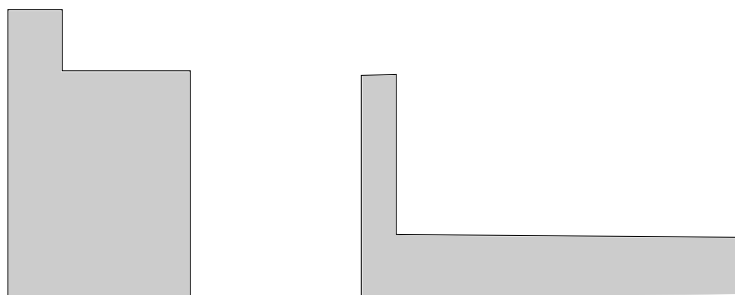


Challenge of the Week

Problem #5 - November 9 to November 20, 2015

Consider a plane L-shaped figure, or just an L-figure, which is a non-convex hexagon made up of two rectangles joined along an edge. Two samples of the L-figure are shown below, where the first L-figure is “massive” in its horizontal bottom part and is “skinny” on its vertical part, whereas the second L-figure is “skinny” in both parts, horizontal and vertical.



You have a ruler with no marks on it, so you can draw only straight lines through two points in the plane using this ruler, but cannot make marks on the ruler or measure distances. Your aim is to draw a straight line, ℓ , in the plane that dissects the L-figure into two connected sub-figures of the same area. How can such a line ℓ be constructed? Show all steps in your construction. **Justify your answer!**

Direct any questions to Gregory Galperin, OM 3361; or Grant Lakeland, OM 3630.

Rules and Awards

- 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 (OM3611) by 2:00 p.m., Friday, November 20, 2015.
- Entries will be judged on the basis of clarity of exposition and elegance of solution. That is to say, the *explanation* is more important than the answer.
- An Award of \$25 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 reward. In the case no award is made for this challenge, \$25 will be added to the next challenge.
- Challenges, solutions, names of all solvers, and comments will be posted on the Challenge of the Week homepage:

<http://www.eiu.edu/math/challenge.php>.