

Problem Set 4

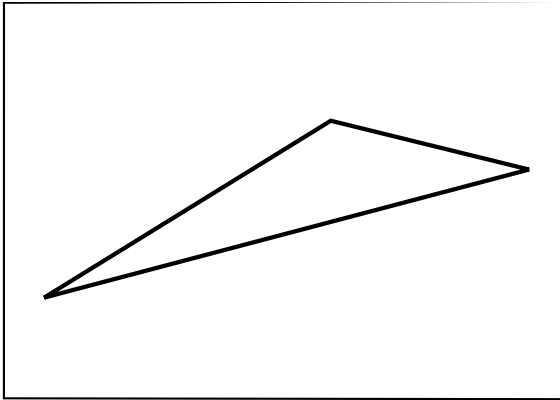
Due: Thursday, October 11th, 2012

We will drop (ignore) your lowest score on any one problem.

Problem 1. Prove that, for any polygon with n vertices, its straight skeleton has $O(n)$ vertices, edges, and faces (as mentioned in lecture). You may assume any other properties of the straight skeleton mentioned in lecture.

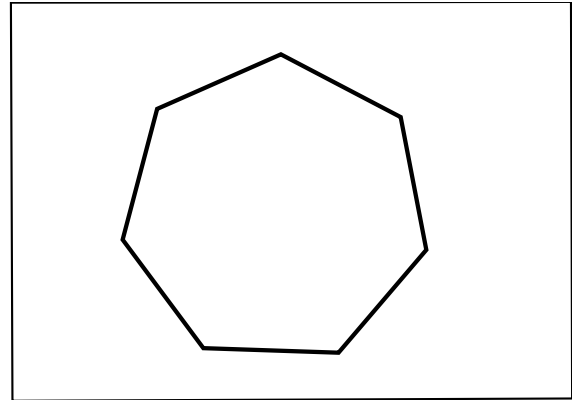
Problem 2. Design and fold (but do not cut) a fold-and-cut model using the straight-skeleton method. Email us a copy of your design (including crease pattern, in vector format) and submit a folded one with your pset. We highly recommend that you use a vector drawing program that can compute accurate intersections, such as Inkscape (free), Cinderella (mostly free), Adobe Illustrator (commercial), AutoCAD (commercial), or Rhino3D (commercial).

Problem 3. Which of the following graphs can be cut by all-layers simple folds and one complete straight cut? For each, draw a folding sequence or argue why there is none.



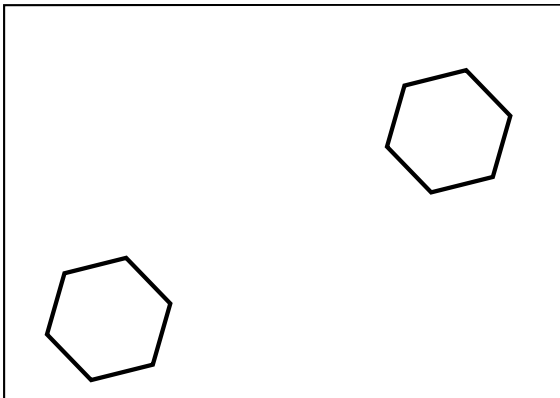
(a)

<http://courses.csail.mit.edu/6.849/fall12/psets/ps4-3a.pdf>



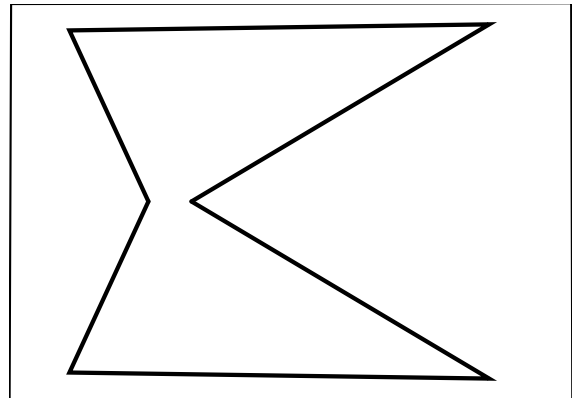
(b)

<http://courses.csail.mit.edu/6.849/fall12/psets/ps4-3b.pdf>



(c)

<http://courses.csail.mit.edu/6.849/fall12/psets/ps4-3c.pdf>



(d)

<http://courses.csail.mit.edu/6.849/fall12/psets/ps4-3d.pdf>