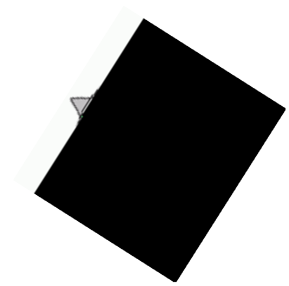
3rd Annual Math Match   February 13, 2012

1. Prove that for every , — .

2. Consider a triangular sheet of paper with vertices at the points , , and . By making a single vertical crease in the paper and then folding the left portion of the triangle over the crease so that it ov



Solutions or hints:

1. — ——— — — so ——

2. -overlap If the fold is at *x*, then this area is –
maximum occurs at – and equals 2. Hence the minimum area of the desired shape is .

3. Consider the function . Since then
there is a s.t. . So and finally —— .

4. Consider the upper right part of the figure. On the diagram, and – .
We have – –. Let and . Then , where — from
properties of equilateral triangle.
Let and . Then – and – .

Area of – — and area of – – – – .