Introduction to Partial Differential Equations 11-11:50am Main 0003 Fall 2012 Instructor: Russell Brown Office: POT741 Phone: 257-3951 russell.brown@uky.edu Office Hours: WF 2-3 in POT 741 and by appointment.

Homework 8. Due Friday, 30 November 2012 Please remember that you are to attend 4 seminars or other events and hand in written summaries.

- 1. Evans, page 163-4, #9, 10, 11, 13.
- 2. (Extra credit) Take a sheet of paper. Draw a line across the paper and mark a point that is not on the line. Fold the paper so that the point folds onto the line. As we may fold our given point onto different points on the line, we form a family of lines. Can you find a nice parametrization of this family of lines and identify the envelope of this family?

To make the problem precise, fix coordinates. Let the point be (1,0) and let the line be y = -1. Thus, if we fold the paper so that (1,0) is folded onto (-1,0), the fold line is y = 0. If you fold (1,0) onto (a,-1) can you find the line as a varies? Can you find the envelope of this family of lines? Is there a better way to parametrize the lines?

November 18, 2012