

Geometry #13

Before Tuesday, November 13, 11 pm

Go to the Forum “Place-Based Geometry” and make at least one substantive contribution by 11 pm, Tuesday, November 13, and at least one substantive response to others’ postings before class on Thursday, November 15. Write about the following: Cast your mind back on the large themes of the geometry we have considered in the course thus far, or other themes yet to be discussed. Make a brief proposal (just a few sentences) for an investigation or lesson that is placed in a rural context to introduce some important concept. Here are two simple examples; I’m sure you can come up with better ones!

Gather some quilt patterns and analyze their symmetries. Classify the quilts according to their symmetries. Try to find at least one example of a quilt pattern for each of the 17 two-dimensional periodic symmetry groups.

Estimate the area of some pieces of land based on their topographical maps. Include examples of flat land, pieces of land that are essentially “ramps”, “cones”, “bowls”, and some that are more complicated, like Flattop in Anchorage.

Thursday, November 15, 7–9 pm

Attend the Adobe Connect session to discuss the readings, forum, and comments and questions on the assigned homework due on Sunday, November 25 (that’s right—you have two weeks this time). We will also have two class presentations.

Before Sunday, November 25, 11 pm

The next two weeks focus on isometries—rigid motions in the plane—and the development of formulas for them. Read Section 5, pp. 89–105, and Section 8, pp. 115–132, of *Geometry for Middle School Teachers: Companion Problems for the Connected Mathematics Curriculum*. Homework problems due Sunday, November 25, 11 pm, uploaded to the Moodle site as a single file less than 2 MB, or else emailed to the address lee@ms.uky.edu. Please use Word or pdf files only. You may use outside sources if you find yourself getting stuck, but I urge you to first try to work them out yourselves.

1. Exercise 5.26. This is one of the motivations for defining matrix multiplication the way we do!
2. Exercise 5.27.

3. Exercise 5.30.
4. Exercise 5.31.
5. Exercise 5.33.
6. Exercise 5.34. (Then try Exercise 5.35 on your own, but not to turn in.)
7. Exercise 5.36.