

MA 308

Homework #1

Due Tuesday, January 25

1. Download the *Common Core State Standards for Mathematics* from http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf. These standards have been adopted by the state of Kentucky and 39 other states—see <http://www.corestandards.org/in-the-states>. If you are a future elementary school math teacher, read the section for Grade 5, pages 33–38. If you are future middle school teacher, read the section for Grade 8, pages 52–57. Then list three items that you currently feel least comfortable with teaching. For each one, also provide the key for the standard, the item number, and the page number. For example, one of your choices might be:

8.NS.1 Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number (page 54).
2. The distance between the point (x_1, y_1) to (x_2, y_2) is $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$. Explain how this formula can be figured out from an application of the Pythagorean Theorem. (This is something that Eighth Grade students are required to understand.)
3. Answer all of the questions on page 64 of the Locker Problem handout, including short justifications.
4. From pages 66–68 of the Locker Problem handout, answer questions 14, 19, 21, including short justifications.
5. Find and justify a method to determine the *number* of factors of a positive integer using its prime factorization. Use your method to determine how many factors the number 324,000 has. (You do not need to actually list all of the factors.)