

# MA 308

## Homework #2

Due Tuesday, February 1

1. Go to the National Library of Virtual Manipulatives, <http://nlvm.usu.edu>. Select Algebra 6–8, and then select the Coin Problem. Practice solving the coin problem with 9 coins. Then write down a clear general procedure for solving this problem in exactly two weighings.
2. Making sense of fraction multiplication. You probably already know how to use a diagram of a rectangle to make sense of positive integer multiplication such as  $3 \times 4 = 12$ —draw a rectangle that is 3 units wide and 4 units long on grid paper, and observe that the area consists of 12 square units.
  - (a) Make a rectangle diagram to make sense of  $\frac{2}{3} \times 5 = 3\frac{1}{3}$ . Explain why your diagram helps makes sense of this multiplication.
  - (b) Make a rectangle diagram to make sense of  $2\frac{1}{2} \times 3\frac{2}{3}$ . Explain why your diagram helps makes sense of this multiplication.

Make neat, accurate diagrams! You can download free graph paper from this website: <http://incompetech.com/graphpaper>.

3. Write up your solutions to the Crossing the River problems on the class handout that you will receive and start solving on Thursday. As usual, include explanations. This problem is also posted on the course website, <http://www.ms.uky.edu/~lee/ma308sp11/crossing.pdf>.
4. Read “Teaching Beliefs” by Cathy Humphreys. This is posted on the course website under “Problem Solving”, <http://www.ms.uky.edu/~lee/ma308sp11/humphreys.pdf>. This is the teacher from the video that we saw in class.
5. Read Chapter 1 of *Fostering Algebraic Thinking*.