Solving problems:

1. Adapt 2 of the strategies in the pigs and chickens problem (Bassarear readings) to solve (show 2 different ways to solve). You may use guess and check or guess-check-revise, but not both for your two solution strategies.

At the penny candy store, you can buy small gum balls for 5¢ and large gum balls for 8¢. Janet bought 12 gum balls, and she paid 75¢. How many large gum balls, and how many small ones did she buy?

For problem #2 **read the directions!** I want to see your problem solving process here—how you make and carry out and evaluate a plan. You don’t *have to* get the answer to the complete problem in order to get full credit. You *do* have to show me your problem solving process.

2. For the following problem,

a. Try to come up with a similar, simpler problem that you could solve. Describe how you are simplifying the problem, and solve your simpler problem (show your work).

b. Does your solution to the simpler problem show you how to get the solution to the larger problem? If so, solve the larger problem. Show or explain how you solved it.

If not, come up with another plan for how to try to solve the problem. Describe your plan, and spend several minutes carrying out your plan.

c. Look back and evaluate—what worked or didn’t work about your plan? Can you check your solution or partial solution in any way?

Imagine a hall with a large number of lockers (for now, let’s say 400 lockers), each locker has a number on it (1-400), and all of the lockers start out closed. In the hall are the same number of students as lockers, and each student has a number (students are numbered 1-400). The students are going to go down the hall in order.

* The first student is going to open every locker
* The second student is going to close every locker whose number is a multiple of 2 (all of the even lockers)
* The third student is going to go to every locker whose number is a multiple of 3, and if the locker is open, they will close it, and if it is closed, they will open it.
* The fourth student is going to do the same as the third, except for lockers whose number is a multiple of 4: if the locker (that is a multiple of 4) is open, the student will close it, and if it is closed, they will open it.
* Keep going the same way: the n-th student will go to all lockers that are a multiple of n, and if the locker is closed, they open it, and if it is open, they close it. Students all go in order from 1-400.

The question is—which lockers are open at the end?