

Name:

Math Olympiad Exploring! – Problem Due: – March 11, 2004

Opening and Closing Lockers

After recess, the 100 students in the 8th grade decide to have a little fun. They know that there are 100 lockers in the hallway between the playground and their class. So the first student goes in and opens up every locker. The second student goes in and closes locker numbers 2, 4, 6, and all even lockers. The third student goes in and looks at every third locker (3,6,9,12,...) and if it is open she closes it and if it is closed she opens it. The fourth student goes in and does the same thing to lockers (4,8,12,16,...). This continues until all 100 students come in.

Question: Which lockers are open after all the students open and close the lockers?

(Hint: Make a chart or a table)

Question: What is a rule that tells you which lockers will be open and which will be closed?