Math 5 Name: _____

Fall 2013 HW #1.

Problem 1.

There are 2013 students attending a small college in New Hampshire, each having their own locker. One April Fool's Day, the students devise the following prank. They all remove the locks from their lockers but leave the doors closed. The students then line up. The first student opens each locker. The second student changes the state of each second locker. (Changing the state means that if the locker is open, the student closes it and if the locker is closed the student OPENS it. In this case, the second student will find all the lockers open so s/he will close ever second one.) The third student changes the state of every third locker. The fourth student changes the state of every fourth locker. And so on and so forth until the 2013^{th} student goes through and changes the state of the 2013^{th} locker.

After this prank, how many lockers will remain open? Which ones? If you were given N many lockers, state how many lockers will remain open? Which ones?