No books or notes may be used on this exam. **Choose one of the two problems below to solve**. You will have 45 minutes to answer your chosen question. Please write legibly and keep your paper as organized as possible. I will collect both your scratch work and your final answer. **Your final answers should be nicely written to convey your ideas and convince the reader of the answer.**

Turn off your cell phone and do not wear headphones during the exam. You may use a calculator as long as it does not connect to the internet. Good Luck!

Name: _____

Card Tricks: You have ten cards numbered 1 to 10. Your task is to arrange them in a particular order and put them in a stack, hold the stack in your hand, and then do the following: Put the top card on the table faceup, the next card on the bottom of the stack in your hand, put the next card on the table, put the next card on the bottom of the stack and so on, continuing to alternate cards that go on the table and under the stack, until all ten cards are on the table.

That of course is easy to do. The trick is to lay the cards on the table in numerical order. In other words, the first card you put on the table will be 1, the next card you put on the table will be 2, and so on. In what order should the cards be arranged in the original stack so that this will happen?

Pacific Sailing: A man who lives in the South Pacific is planning a sailing trip. His sailboat will hold him plus enough food to last three weeks. By a strange coincidence, there are small islands about one week's sailing apart. He plans on sailing to the fifth island, which is a large island with stores similar to the main island that he is on now. The four small islands in between, however, have no stores and he will not be able to buy any food on those islands. So he realizes that he will have to sail out to an island, store some food, and return to the main island for more supplies. Show how he should organize his food supplies so he can get to the fifth island. How many weeks will it take altogether?

Solution: **Problem Chosen:** _____