

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: _____

Chocolate Frog Cards: Ron and Ginny were admiring each other's chocolate frog cards. Ron had quite a few cards, and Ginny had some of her own. Ron was trying to impress Ginny, so Ron gave Ginny as many chocolate frog cards as Ginny already had. Ginny then gave Ron back as many cards as Ron had left. Ron, not to be outdone by Ginny's generosity, gave Ginny back as many cards as Ginny had left. This left poor Ron with no cards and gave Ginny 40 cards altogether. How many chocolate frog cards did each of them have just before these exchanges took place?

Getting to 81: This is a game for two people: taking turns, choose a number between 1 and 9. Keep a running total. (For example, if you pick 5 and your opponent picks 7, the total would be 12. Then you might pick an 8, so the total becomes 20, and so on.) You win the game if you can make the score exactly 81 on your turn. (If it were your turn and the running total at that point was 79, you would say 2, making the score 81, and you would be the winner.) You are going to choose the first number. What number should you pick to guarantee a win for yourself, and what strategy should you follow?

Solution:

Problem Chosen: _____