Final Exam Name:_____

Please include all your work on the plain white paper provided.
I will not look at this sheet for answers.
No calculators may be used. None required.

B. You will explore and solve the **Handshake problem:**

Structured Investigations:

You are in a roomful of 35 people. Everyone is asked to shake hands with everyone. How many handshakes will there be?

1. **Explore** this problem, using the following detailed steps:

a) Give a rough **estimate** the number of handshakes in a roomful of 35 people and explain how you got this number. (You will not be graded on the accuracy of your estimate. So don't fix it as your ideas evolve.)

b) Start exploring how many handshakes there would be when you have 1, 2, 3, 4, 5, etc people. Draw pictures to help you reason about this. Clearly **explain** your reasoning (clear and appropriate reasoning gets the credit).

c) For 5, 6, 7, people, draw a **picture** that illustrates clearly how many handshakes there would be (clear and appropriate pictures get the credit).

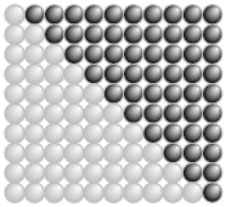
d) If you have 5 people with a certain number of handshakes, how many additional handshakes do you get when you **add a sixth person**? What pattern do you observe?

e) Collect your results in a table and extend it up to 10 people.

2. Clearly describe the **pattern** that you observe, in words or formulas. **Explain** why you believe this pattern to be true **in general**.

3. Based on the pattern you observed in part (2), **how many** handshakes are there in a roomful of 35 people? Reflect on how this compares to your estimate in problem (1a)?

4. (Extra Credit) How about any number of people, e.g. **350 people**?
*Hint: 1 + 2 + 3 + ... + 10 = (10 * 11)/2. See picture:*



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A. Pre-scheduled one-on-one Cube Final Exam, using the "Corner's First" method . (Done.)

B. You will explore and solve the **Handshake problem.**

The Big Question:

> *You are in a roomful of 35 people. Everyone is asked to shake hands with everyone. How many handshakes will there be?*

Explore this problem using the problem solving strategies you developed and used throughout the semester in Math 110. Start by estimating a number (you won't be judged on its correctness). Clearly **document your reasoning** and **clearly explain your thinking**. Use pictures, tables, and written paragraphs, as needed.

Credit will be given for the clear documentation of reasoning and for clear explanations, rather than just a right or wrong answer.

Option: more structured Investigations:
If you can't find a way to get started with this Big Question, you may ask for a more structured list of assignments, for a 5% reduction in points (ie. the maximum number of points will be 95 instead of 100; note that 95 points is still an "A").

Final Exam Name:_____

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A. Rubik's Cube -- keep a record of the time for each stage. If you are not done after 15 minutes, move on to Question 2.

Mix it up. When done, record the time _____ .

Solve it. When done, record the time _____ .