

Instructions:

- This competency demo follows the procedures spelled out in your syllabus. That is, this exam is **closed book, closed internet, closed fellow students**. However, you may use any **handwritten** notes (of your creation) in your notebook.
- The exam consists of 14 questions on six pages. Be sure that you have all of these items and that they are all legible.
- NOTE: For these problems, the setup of the problem is probably more important than the final, “numerical” answer.
 - In order to get partial credit for incorrect answers, please make sure that you indicate how you solved a problem, not just the final answer.

You should be able to:

1. Apply the sum and product rules to count the number of ways a task can be completed.
 - Exercises in 10.1
2. Apply the formula for Permutations to count the number of ways a task can be completed when the order matters.
 - Exercises 10.4.2, 10.4.3, 10.4.4
3. Apply the formula for Combinations to count the number of ways a task can be completed when the order doesn't matter.
 - Exercises 10.5.2, 10.5.5, 10.5.6, 10.5.7, 10.5.8
4. Apply the formula for Permutations with partial repetition to count the number of ways a task can be completed.
 - Exercises 10.7.1, 10.7.3, 10.7.4, 10.7.5
5. Understand from context if a problem is a Permutation or a Combination.
 - Exercises in 10.6
6. Apply the complement rule to solve a Permutation/Combination problem.
 - Exercises in 10.10
7. Apply the inclusion/exclusion rule to solve a Permutation/Combination problem.
 - Exercises in 10.11
8. Calculate the probability of discrete events.

- Exercises in 12.1
9. Use unions and complements to aid in the calculation of the probability of discrete events.
- Exercises in 12.2
10. Calculate the conditional probability of an event.
- Exercises in 12.3