

Each exam's Topics/Objectives List tells what I'll expect of you on that exam, and gives an outline for creating your own, detailed study guide. Compare the list to your **notes, in-class materials, reading, online links, Weekly Assessments, Required Practice, and extra practice problems** - you might recopy key definitions and explanations, rewrite thorough examples of tasks and solutions, jot down warnings of what not to do, etc. Strive to master concepts, explanations, and computational techniques in general; memorizing specific examples is seldom successful.

Using problem flashcards, studying together, and seeing me or the MAC tutors can help.

For exams in math, science, psychology, etc., starting to study well in advance and putting in good time can help you tame test anxiety by feeling well-prepared to recall what you understand. Strong students can probably get by with 1-2 hours of exam prep per day at first, then 2-2.5 hours per day for the last two days. But if you've been struggling, expand those estimates!

**Probability:** Understand, clearly define "experiment," "outcome," "sample space," "event." (**from notes**)

1. Name all 4 kinds of probability; describe/characterize each; identify which one a given problem is using.
  - (a) One experiment might use more than one kind, such as geometric (for a spinner) AND theoretical (thinking about the spinner ideally).
  - (b) If I give you a table of observations, you should consider that strictly experimental.
2. For the three numeric kinds of probability (know which they are), give the formula when asked.
3. Given a list of words/phrases, tell the intuitive probability of simple events for an experiment.
  - (a) If asked, explain your choice, referring to counts of favorable versus unfavorable. Do NOT create fractions, and do NOT compare to totals.
4. Explain clearly what "even chance," "equally likely" mean and how they're different. (See notes!)
5. Given a desired intuitive probability, create/change a sample space to fit; explain, especially if not possible.
6. Understand, use the logic of "and," "or," at least/most, etc. in probability.
7. Write several alternatives to "at least," "at most."
8. Convert between probability that an event happens/doesn't (complementary).
9. Know, understand the 6 phrases and notation that can be used to ask about probability (from "What is the probability (all spelled out)...?" to " $P(E)$ ").
10. Recognize fractions of circles (especially in clock-format) to find geometric probabilities.
11. Create spinners so that given lists of probabilities will occur, as in Activity, practice, and RP.
  - (a) Beware clues with probabilities of 1: if any outcome in an event occurs, the event itself occurs, but it's NOT true the other way around (an event can occur even though some of its outcomes did not).
  - (b) Prepare to use good scale; create a clock-format if needed.
12. Explain what a trial is in experimental probability.
13. Use tables of observations to find experimental probabilities. Beware: ALWAYS use entire SS!
14. Recognize whether a given set of outcomes is a sample space for a stated experiment.
15. List all favorable outcomes that belong to a given event. (Mark them yourself even if not asked.)
16. Tell what "uniform SS" means; recognize/create SSs that are/are not uniform.
17. Explain clearly what single-stage versus multi-stage mean for experiments. (See notes.)
18. Identify a given experiment as single- versus multi-stage; give your own examples when asked.
19. List the two approaches that can help children create uniform SS's for multi-stage experiments.
  - (a) For "Imagine," clearly name the two types of imagining we can do, and give examples.
20. Draw correctly labeled trees and use them to find all outcomes in a uniform SS.
21. Also create ordered pairs/triples, etc., with a legend (but no tree) to list a uniform SS.
22. Predict how many mix-and-match outcomes are in the uniform SS or a given multi-stage experiment.
23. Find theoretical probabilities, including with and/or, at least/most, etc.
24. Given a uniform sample space without experiment (see WA, practice), find probabilities about it.
25. State Law of Large Numbers (LLN). Use it in explaining whether an observed SS or list of tallies is uniform or not.

26. Also use LLN to explain whether given experimental probability supports a uniform SS (as in 0.5 vs 1/3 two coin discussion in notes).
27. Apply LLN to predict how many times an outcome \*should\* occur in a large number of trials.

**Counting:** Know/describe how this form of counting is different from Grades K-1 counting.

1. State the Fundamental Counting Principle (FCP); name the 3rd grade scenario it is related to.
2. Use the FCP (blanks) to determine how many ways or options there are to complete a multi-step task or to create a multi-step object.
  - (a) I may ask for answers to be UNSIMPLIFIED versus simplified, so read carefully.
3. Prepare for FCP settings in which repetition is allowed versus not. Ask if you're unsure.
4. Also prepare to decide about repetition on your own from context:
  - (a) For instance, choosing classes to take next semester CANNOT involve enrolling in the same class twice, so you should be able to sort out that repetition of classes isn't allowed without the problem's instructions spelling that out.
  - (b) However, scheduling for next semester COULD involve taking the same professor for two different classes, so repetition of professors would be allowed.
  - (c) You can ask about repetition anyway, but I might have to say "I can't tell you" for some problems.
5. Prepare for questions where an early choice limits later options: no repeats, same letter every time, etc.
6. ~~Recognize when the Addition Principle is needed, and use it. This can occur because of:~~
  - (a) ~~Incompatible lengths: "How many 2- or 3- letter codes can be made using only letters A through J?"~~
  - (b) ~~Incompatible mixes of ingredients: "How many 3- symbol codes can be made that either use ONLY letters or use ONLY digits?"~~
7. ~~Recognize when the Subtraction Principle is needed, and use it. This occurs when we are asked about "at least one."~~

**You will have the entire class period to take the exam. When you finish, you may hand it in and leave.**

**Chairs will face the projector; sit in the rows I indicate, for easier walking without disturbing others.**

**You need a calculator (not cell phone, no alphabet), but no other aids.**  
(If you forget, you can borrow from me, but mine don't have +/- keys.)

**Students with documented accommodations should speak with me and process ODS requests ASAP.**  
ODS should proctor your accommodations since our classroom and my schedule are not automatically free.

Make-up Policy:

1. Notify me immediately if you'll miss the exam.
2. Documentation will be required: get a doctor's note, accident report, newspaper notice, etc.
3. If I excuse your absence, the Exam #3 content on our cumulative Final Exam in December will also be your make-up exam.
4. (D2L will show an artificial 0 for any excused absence until the end of the course.)