Each exam's Topics List describes what knowledge and skills I'll expect you to demonstrate on that exam.

The List can be an outline for creating your own, detailed study guide where you include concrete problems and write out all the definitions and explanations in the list. Compare it to your notes, in-class materials, reading, WAs, RPs, and extra problems (on web) to find those key definitions and explanations, to rewrite thorough examples of tasks and solutions, to jot down warnings of what not to do, etc. Aim to master concepts, explanations, and computational techniques in general; memorizing specific examples is seldom successful.

You should invest a good amount time in studying for college-level exams: **1-2 productive hours each day for the week leading up to an exam** will make you much more prepared (and LESS anxious!) than only 2-3 hours in the day or two before. And studying together is a plus!

Problem Solving: Know that true problem solving involves new or unfamiliar situations. Don't panic!

1. Identify a given explanation as telling how (giving a process) versus telling why (giving reasons) versus doing neither, and explain your choice. Avoid tangling these in your own explanations.
2. State Polya's Four Steps in order. Spell his name. Know we use the Steps for problem solving.
3. Expand on each step by giving 1-2 additional issues involved in or needed for that step.
4. Identify which step seems most involved in a short problem-solving story, and why you think so.
5. Memorize strategy names and full characteristics from Summary #1. Use them for:
   (a) Given a problem, name several strategies that might/might NOT work in solving it.
   (b) Justify your strategy by stating key characteristics of the problem that fit the strategy. That is, tell WHY to choose the strategy, not HOW to use it.
6. Solve a problem, possibly unfamiliar; I may require a certain method vs. leave the choice to you.
7. Tables/diagrams/pictures/variables need clear labels (like "Number of..."). And if you use an abbreviation, explain at the start what it stands for.
8. Guess and Check should use "intelligent guesses." If asked, explain what's wrong with a given guess AND what changes you'll make to improve the next guess.
9. Practice flexibility - use new "tricks" you've seen - but prepare for VARIABLES to be forbidden.
10. Demonstrating/assessing your problem solving skills by definition involves new, unfamiliar situations, not just tasks you've seen in class; don't let that unfamiliarity scare or intimidate you.
11. Just your use of Polya's steps counts for a lot.
12. Draw, fully label Work Backwards diagrams when asked. Don't confuse fractions kept vs gone.
13. Use your choice of method to solve fraction problems like the 5th grade Unit Fraction handout.

Sequences: Algebra/variables - other than a_1, a_2, etc. - will NOT be permitted in sequence problems.

1. Find next or early term(s) in a given sequence of numbers, diagrams, etc. Explain when asked.
2. Give clear, meaningful VERBAL definitions for each of the five special types of sequences: arithmetic, geometric, Fibonacci-type, repeating, difference sequence. (Memorize from your notes!)
3. Classify given sequences: arithmetic, geometric, Fibonacci-type, repeating, or no special type.
4. Given an original sequence, show its difference sequence... and vice versa.
5. Explain in a sentence what the term common difference (CD) or common ratio (CR) means.
6. Identify CD or CR of a given arithmetic or geometric sequence.
7. Sequences can use decimals, fractions, or negative numbers in general, or as CDs and CRs.
8. Make up sequences satisfying given conditions and comparisons, including using a_n notation or info related to the 5 special types.
9. Find distant terms for arithmetic or repeating sequences. Prepare to explain, if asked.

(continued on back)

Algebra for Teachers: Know, name the K-4 operations: addition, subtraction, multiplication, division.

1. Explain clearly - in sentences - the FOUR steps in the Order of Operations. (Spelling out the 6 words for "PEMDAS" isn't sufficient.)
2. Apply the Order of Operations one operation at a time to simplify a numeric expression.
3. Place parentheses in an equality to make it correct, as in Problem #4 of practice HW #5P.
4. Memorize full names, Grade 3-5 explanations, and formulas for properties on Summary #2.
5. Given the name of a property, explain what it means entirely in words (3rd-5th grade style).
6. Given the name of a property, give an example of a number sentence that illustrates it.
7. Given a 3rd-5th grade style description of a property, tell the name of the property described.
8. Given a number sentence, identify (closely spell) the FULL name of the property it illustrates.
9. Identify a given example as an equation, a number sentence, or an expression.
10. Give your own examples of equations, number sentences, or expressions.
11. Recognize correct vs. incorrect use of = sign in examples; use it correctly in your OWN work.
12. Fix bad = sign usage with your choice of one new equality vs a list of separate, smaller equalities.
13. Simplify algebraic expressions one step at a time (Distributive Property vs combining like terms).
14. Given a verbal setting/description, write an algebraic expression that represents it.
    (a) Settings WILL be abstract like "a number x increased by 5," not daily-life context like "the price of P pizzas at \$8 apiece."
15. Solve linear equations ONE step at a time; clearly show when it's the same action on both sides.

Number Sentence Terminology: Understand "whole numbers" vs "counting numbers." Also 0 is even!

1. Memorize and closely spell the terminology for all parts of number sentences.
2. Create number sentences having given numbers in specified roles; recognize when you cannot.
3. Create whole number sentences with more general behaviors or comparisons among their parts (such as "the addends have a product of 12"); explain impossibles.
4. Given a number sentence or just a list of numbers, write the complete associated Fact Family.
5. Memorize the constructivist definitions of subtraction and division. Use them to switch between "related" operations in Fact Families.
6. ~~Tell when division with 0 is possible/not; use constructivist definition~~ **or partitioning** ~~to explain.~~

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

You may use a basic calculator (not cell phone, no alphabet), but no other aids are permitted.

Students with University-approved testing accommodations should speak with me ASAP.
You and I must agree on the conditions for your ODS Test Room Booking BEFORE you submit it.
(ODS must proctor your exam, since our classroom and my schedule are not automatically free.)

Make-up Policy:

1. Notify me as soon as possible if you'll miss the exam.
2. Documentation is required: get a doctor's note, accident report, newspaper notice, etc.
3. Unlike high school, we will **NOT** schedule a special make-up exam for immediately when you're back: that delays feedback and releasing solutions to everyone else.
4. Instead, if I excuse your absence, the Exam #1 content on our cumulative Final Exam in May will also serve as your make-up exam.
5. (D2L will show a blank or an artificial 0 for any excused exam absence until the end of the course.)