

Study the topics below, in conjunction with all materials from the course. Studying together is also a plus.

Number Sentences, Fact Families, Scenarios - Using whole numbers, integers, fractions, decimals

1. Know, closely spell names of all parts of addition, subtraction, multiplication, and division sentences.
2. Create a number sentence having given numbers or behaviors in certain roles. If not possible, explain.
 - (a) Pay attention to which types of numbers the question allows. That affects possible/impossible.
3. Create a complete Fact Family that goes with a given number sentence or list of numbers.
4. Memorize names, operations, characteristics of word problem scenarios, from Summaries #1-1.5.
5. Given a decimal, fraction, or whole number word problem, write the complete number sentence it requires, name the operation it requires, and/or name the scenario it illustrates.
6. Create an original word problem that requires a given computation and scenario.

Integers: Know that the set **Z** of integers consists of the whole numbers and their opposites.

1. Understand that a “-” sign in front of an EXPRESSION or VARIABLE does not make it a negative number (as in, $-x$ could be a positive number if x is itself negative). Zero is neither positive nor negative.
 - (a) Do NOT rename a variable to include a - that isn't given: for instance, in **Problem #5 of WA #3**, S is already negative, so don't refer to it as “ $-S$ ” in your explanations.
2. Understand integers on the number line and that LEFT is always LESS. Avoid the phrase “greater negative”!
3. Understand absolute value as distance from zero physically, and as the “positive version” of a number.
4. Answer questions about integer arithmetic rules applied to variables on a number line; explain carefully.
5. Place variables on a number line to fit given info about their operations, absolute values, and/or greater/less.
6. Work with models: Clown, chips. Memorize rules, interpretations that go with each.
 - (a) Work with models MUST use the original numbers and operations, no rewriting. (I.e., $2 - (-5)$ must be treated as “2 minus negative 5,” and NOT as “2 plus 5.”)
 - (b) Describe the movements, start, and end of the Clown-on-a-Tightrope for a given computation.
 - (c) Write the complete, precise integer number sentence acted out by the Clown in a given story.
 - (d) Verbally explain steps to act out a given **add/subtract/multiply/divide** task using chips. If you put in zero pairs, tell WHY. State the chip AND numeric answers.
 - (e) For chip multiplication or division, recognize/create computations that are impossible to act out, explaining what goes wrong.
 - (f) **Temperature stories and Number Sentence Patterns will NOT appear on the Final.**

Decimal Number Basics, Arithmetic, Appearances, Ordering:

1. Identify positions in a numeral by written name, numeral/fraction (as in 100s or 1/10s), exponent.
2. Convert: standard notation, word form, expanded form with multiplication/with exponents.
3. Round decimal numbers; remember that the rounding place MUST contain a digit (even if it's 0).
4. Find one or more numbers that round TO a desired result, including rounding up vs. down.
5. Find some/all decimal numbers satisfying given clues, including rounding or exponent clues.
6. Add, subtract, multiply, divide decimal numbers by hand, showing clear, teacher-like markings.
 - (a) Explaining what we do with the points, and why, will **NOT** be asked on the Final.
7. Recognize (**visually and by name**) the 3 appearances of decimal numbers; give meaningful examples suited to children (NOT π).
 - (a) Be careful about blindly trusting your calculator display to tell the difference.
8. Correctly use, interpret bar vs ellipsis notation (or its absence!). Convert between these when possible.
 - (a) Do NOT use an ellipsis to indicate digits going on “randomly.” Establish a pattern instead.
 - (b) Know that repeating decimals ARE non-terminating - their digits do NOT stop.
9. Identify or give examples of decimal numbers that are rational/irrational.
10. Convert fractions to decimals; round, use bar, or use ellipsis as allowed.
11. Order a given set of fractions and decimal numbers by size, including non-terminating.
12. Identify just the largest, smallest, etc. from a list of fractions and decimal numbers.
13. Know and clearly state what the concept of denseness means for decimal numbers.
14. Demonstrate denseness, including making rational or irrational numbers between others.

Percents: Especially study the Required Practice and web site practice problems here!

1. Use correct notation to convert back and forth among decimals, percents, and fractions.
2. Round to the nearest tenth, hundredth, etc. of a percent when asked. Round decimals as well.

- (a) Remember that you can ALWAYS round ANY number that is in standard form.
- 3. Solve percent word problems that don't have any "real life" context (IS/OF problems).
- 4. Solve word problems about percent increase/decrease. Identify which happened.
- 5. Given a discount or mark-up situation, analyze whether it is correct to apply the percent to the other number shown in the problem.
 - (a) Justify by identifying whether the other number is newer versus older in the story.

Statistics: DRAWING statistical graphs will NOT appear on the Final.

- 1. Read and interpret graphical information, including to get numbers to find mean, median, mode, etc.
- 2. Find mean, median, mode(s), range of a set of scores. Know, explain when we have multiple or no modes.
- 3. Create data that has specified mean, median, mode, or range behavior, as in Activity and practice.
 - (a) Recognize and meaningfully explain situations that are impossible to create.
 - (b) If two pieces of info create a conflict, you should discuss BOTH, not just one of them.
- 4. Given a mean: find the total, find new mean when a few new scores are added, deleted.
- 5. Find a mean when given the means for separate groups of data, as in the cheerleader problem.

Probability: Name the 4 kinds of probability; identify which a given problem is using.

- 1. 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.**
- 2. Given a desired intuitive probability, create/change a sample space to fit; explain if not possible.
- 3. Understand, use the logic of "and," "or," at least/most, etc. in probability.
- 4. 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).
- 5. Use tables of observations to find experimental probabilities. Beware: ALWAYS use entire SS!
- 6. Recognize single- vs multi-stage experiments. Create a uniform SS. Legend your multi-stage outcomes.
- 7. Find theoretical probabilities, including single or multi-stage, and/or, at least/most, etc.
- 8. Given a uniform sample space without experiment (see WA, practice), find probabilities about it.

Counting: Tree diagrams will not be asked about on the Final.

- 1. Use the FCP (blanks) to determine how many options there are for a multi-step task or object.
 - (a) I may ask for answers to be UNSIMPLIFIED, simplified, or both, so read carefully.
- 2. FCP settings may allow repetition or not. Ask if you're unsure. Also prepare to decide from context.
- 3. Prepare for questions where an early choice limits later options: no repeats, same letter every time, etc.

Measurement: *State the (four) steps in the process of measurement.*

- 1. Identify standard vs non-standard units in a list; tell which attribute they measure.
- 2. Memorize and use personal reference units to:
 - (a) Identify the best measurement (number) and/or type of unit from a list
 - (b) Choose the largest/smallest of two or more measurements
- 3. Memorize: English/metric reference comparisons (Summary #4 at the bottom).
- 4. Memorize English conversions named specifically in notes; memorize metric prefix meanings.
- 5. Name or give abbreviations in order of size, for metric units for linear measure, volume, weight.
- 6. Convert measurements using number sense, proportional equations, metric staircase, dimension analysis.
 - (a) **The choice may be yours, including methods of your personal memory or creation, or I may require a specific method: proportional equation, metric staircase.**
 - (b) **Use of dimension analysis will be OPTIONAL, by YOUR choice.**
 - (c) Use unmemorized units or conversions when they are given to you (including for made-up units).
 - (d) Round correctly, write units on all answers.

Geometry: - This content is NOT assessed on the Final; only on the Optional WA #12.

You will have the entire 2-hour 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 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.

End-of-Course Information:

- The Final Exam is worth 140 points out of 600 total points for the course. (See Syllabus.)
- Material will be split roughly equally among the 3 earlier exams' content, with about 10-15% for newest topics.
- I don't expect to have ANY finals graded earlier than Sunday evening, and am often still grading on Tuesday.
- Please don't email/phone for your grade - that only slows me (and your other professors) down.
- I'll post scores on D2L when available; I try to update D2L before the Tuesday afternoon MySRU deadline.
- D2L grades are NEVER official per SRU rules - only the grade reported by your professor on MySRU is official.
- If you think there's an *error* calculating your score, I will definitely look into that ASAP.
- But - there's no extra credit or re-do's after-the-fact: **YOU must take action NOW to ensure the grade you want.**