

Prepare by studying the topics listed below, in conjunction with all materials from the course. The Final Exam is cumulative and worth 150 points. Studying together is also a plus.

Bring an approved calculator - 3-point deduction if you have to borrow from me!

Integers: (Remember the symbol **Z** and the listing notation for the SET of integers.)

1. Know how to arrange integers (and fractions) on the number line and that LEFT is always LESS.
2. Avoid the confusion of statements like “ -5 is a greater negative than -2 .”
3. Answer questions about integer arithmetic rules applied to variables on a number line; explain carefully.
4. Understand absolute value as both distance from zero physically, and as the positive version of a number. Treat the bars like parentheses in the Order of Operations (see text HW problems).
5. Work with models: Clown, temperature or mail stories, Fact Patterns, new models like text HW.
 - (a) You MUST use the original numbers and operations, no rewriting.
 - (b) Draw and explain how to use plus/minus chips to act out a given computation.
 - (c) Recognize/create chip multiplication or divisions that are impossible, explaining what goes wrong.
 - (d) Create Fact Patterns leading to a given computation, applying the guidelines.
 - (e) Describe the actions and answer of the Clown-on-a-Tightrope for a given integer computation.
 - (f) Write the precise integer computation and answer acted out by the Clown in a given story.
 - (g) Write the complete number sentence represented by a given multi-step temperature or mail story.
 - (h) Write a temperature or mail story that models a given integer arithmetic computation.

Word Problem Scenarios: MEMORIZE names of all scenarios on the Summary.

1. Given a word problem, write its complete number sentence, scenario, and object/measurement use.
2. Make up a word problem that uses my choice of number sentence, scenario, and objects vs. measurements.

Fractions:

1. Understand, SPELL, use: numerator, denominator, unit fraction, proper, improper, mixed number.
2. Explain CAREFULLY what numerator, denominator MEAN. (“5 is the whole” is wrong!)
3. Use the part of a whole meaning to explain which position in a fraction can/cannot be zero.
4. Solve diagram problems like those on Activity #1B and HW, including where the whole is unknown.
5. Demonstrate/recognize the FLF where needed: reducing to lowest terms, creating CDs, etc.
6. Find fractions equivalent to a given one, between two given ones. Order a set of several fractions by size.
7. Demonstrate different methods for determining whether two fractions are equal, or which is bigger: drawing, estimating, CDs, cross-multiplying, and numerator/denominator meanings.
8. Explain carefully when using meanings of numerator and denominator to compare fractions. Recognize, create examples where this method fails.
9. Know the term denseness; explain clearly what it says. (“Denseness is a fraction between others” is poor.)
10. Demonstrate ALL steps in performing fraction arithmetic by hand. Explain when/why we need a CD.
11. Draw, explain pictures to perform fraction arithmetic.
12. Show work in converting between mixed numbers and improper fractions, with and without shortcut.
13. Add, subtract two or more mixed numbers IN THAT NOTATION, showing correct regrouping.
14. Create, choose good estimates for given fractions; explain whether estimate is high or low.
15. Answer word problems requiring fraction or mixed number arithmetic, as in text HW.
16. Demonstrate complete pre-cancelling, including when division is shown.

Ratio and Proportion:

1. Convert between ratios in words vs. notation; prepare for “for/out of every,” fractions, or “times” words.
2. Interpret/write ratios in lowest terms. Recognize part-to-part vs. part-to-whole.
3. Distinguish representative sets vs. unit-rate/scaling vs. proportional equations.
4. Solve word problems using each of these when required, and prepare to explain.
5. Solve word problems including multi-ratios, “parts,” changing ratios.

Decimal Basics:

1. Convert: standard notation, word form, expanded form with/without exponents.
2. Round decimal numbers - use a trailing zero when you MUST.
3. Find all decimals satisfying given clues, including rounding or exponent clues.
4. Add, subtract, multiply, and divide decimal numbers by hand.
5. Know what we do with the decimal points for each arithmetic operation, and why.
6. List the three appearances possible for decimal numbers. Give examples of each.
7. Use and understand bar notation to represent repeating decimals.
8. Use and understand ellipsis notation for non-terminating decimals.
9. Know which decimal appearances can and cannot be converted to fractions (are/are not rational).
10. Convert appropriate decimals to fractions, showing work. Create and recognize irrational numbers.
11. Convert fractions to decimals; round, use bar, or use ellipsis as allowed.
12. Be careful about trusting your calculator display.
13. Put decimal numbers in order of size, including those that start in an unhelpful notation.
14. Define the term denseness; find rational/irrational numbers between two decimals.

Percents:

1. Use correct notation to convert among decimals and percents. Round when asked.
2. Solve percent word problems that don't have any "real life" context.
3. Solve basic discount/mark-up problems; careful about which number is IS vs. OF.

Statistics:

1. Create, label all the types of graphs listed on the Summary except scatter, box plots.
2. Read and interpret graphical information, as in HW.
3. Find the mean, median, range, and mode(s) of a list of scores.
4. Given a mean, find the new mean when a few new scores are added, deleted.
5. Find a mean when given the means for some groups of data, as in the cheerleader problem.
6. Create data that has specified mean, median, mode, range behavior, as in HW.

Probability:

1. Recognize whether a given sample space is uniform or not; create ones that are.
2. Determine probabilities of events, including ones using "and," "or," "at least," "at most," etc.
3. Be prepared for multi-stage experiments: two or more dice, coins, spinners, etc.
4. Compute conditional probabilities by limiting sample spaces based on the "given..." phrase.
5. Create spinner diagrams so that certain probabilities apply.
6. Explain how experimental probability helps to see whether a sample space is uniform or not.
7. Solve problems like 9-1A and 9-1B #21-22.
8. State the Law of Large Numbers.

End-of-Course Information:

- The Final Exam is worth 150 points out of 500 total points for the course. See the Day One syllabus.
- Material will be split roughly equally between content from the 3 earlier exams.
- I don't expect to have the finals graded any earlier than Saturday, May 13, at best.
- Please don't email for your grade - that only slows me (and your other professors) down.
- Please don't ask afterwards for extra credit or "is there any way I can make up/re-do...?" - I don't do that.
- If you think there's an *error* calculating your score, I will definitely look into that ASAP.
- I'll TRY to post all scores on D2L so that you can see them before the 3:00 pm May 16 deadline, but can't promise.
- D2L grades are NEVER official per SRU rules - only the grade reported by your professor on MySRU is official.