Compare this list to your notes, in-class materials, reading, online links, Bonus Study Prompts, Weekly Assessments, Required Practice, and extra problems. Refer to the study skills handout from earlier this semester. 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.

Number Theory:

1. Understand and convert between these synonyms: factor, divisor, multiple, divisible, and divides.
2. Demonstrate the definition (box, number sentence, WHOLE #) in explanations, including with the synonyms.
3. Know, use, understand short-hand notation $x|y$ for "x is a factor of y" (and $x \nmid y$ when x isn't a factor).
4. Do NOT confuse the | symbol with a fraction bar, $\div$ symbol, or division.
5. Identify true/false statements or create your own sentences using synonyms or | or $\nmid$ symbols.
6. Especially know how the synonyms pertain to the numbers zero and one.
7. List all counting or whole numbers that are factors or multiples of a given number.
8. List factors or multiples meeting extra conditions: even, odd, prime, composite, certain size, etc.
9. Know that all natural numbers can be classified as prime, composite, or unit; sort examples.
10. Memorize the primes up to 50; be able to test/recognize higher numbers as prime vs composite.
11. State precisely: both definitions of prime, Composite Number Theorem (CNT), Fundamental Theorem of Arithmetic (FTA).
12. Explain clearly what a prime factorization is. Recognize/explain a wrong one (as in text). Don't use "1."
13. Prime factor a given number, possibly using my choice of a Factor Tree vs. Division Tower.
14. Prepare to prime factor numbers that are products or already have exponents.
15. Use the three exponent rules to simplify prime factorization results.
16. Be careful not to stop a tree/tower too early; check that unusual-looking final factors *are* prime (using the PNT).
17. Apply the Prime Number Test to a given number, showing ALL steps. Be sure to draw a conclusion!
18. Roughly spell "Sieve of Eratosthenes." Explain that it's used to find all primes up to a given limit.
19. State what circled versus crossed-out numbers in a Sieve represent.
20. Find, explain the stage at which a given Sieve is complete/number causing last crossing out.
21. Identify whether given numbers in a Sieve are crossed out (and if so, by what other number) or circled.
22. Find the LAST number crossed out in a given Sieve.
23. Use all methods to find GCDs, LCMs: listing, prime factors, Euclidean Algorithm/formula.
24. Explain GCD, LCM in words that use NONE of the acronym's words.
25. Use Euclidean formula to find unknown numbers.

Ratio and Proportion: Decimals ARE allowed on tasks listed below. **Bring/borrow an approved calculator.**

1. Verbally define the terms "ratio" and "proportion." (I expect the definition from notes, not off the cuff.)

2. Recognize additive language versus multiplicative versus "confusing."

3. Use, understand ways to give ratios: words "for/out of every" or "per"; notation colon, "to," (fractions if forced to).

4. Convert ratios given in "for/out of every" words to ratios in a sentence with notation, and vice versa.

5. Identify part-to-part vs. part-to-whole ratios; convert between them, as in notes, practice, Activity.

6. Given a ratio of one type, write a related ratio of the other type.

7. Draw and fully label rectangle diagrams for ratios. Understand "all" versus "all other."

8. Use given ratios to FIND related ratios, such as "If 5 out of every 7 pens are blue, what is the ratio of non-blue pens to blue pens?" or "The ratio of dogs to cats is 3:8; what is the ratio of cats to dogs?"

9. Solve proportion problems, possibly using MY choice of method; prepare to explain if asked.

10. Methods are: representative sets, unit-rate, scaling, proportional equations.
    (a) "Other algebraic methods" are allowed but NOT required.
    (b) However, if you use them, you MUST declare your variable(s) clearly.

11. Recognize the differences between all methods. Label which one you've used when asked.

12. Know which of these methods are algebraic/not; use only those permitted in a given problem.

13. For representative sets, include a clear legend for your picture, such as $C = 1\ cat$, not $C = cat$.

14. For scaling or unit-rate, show clear, thorough arithmetic steps from original ratio to final target. Explain your steps when asked.
    (a) Distinguish between additive vs. direct scaling if asked; otherwise you can mix them.
    (b) Know that *successful* unit-rate scaling requires us to find about 1 of the *target* item.

15. Find the scale factor from an original ratio to a target in direct scaling.

16. When you create proportional equations, charts are allowed but not required. Labeling *is* required, either in your chart or in the equation itself.

17. Solve problems with multi-number ratios, such as fair-share pay, inheritances, "parts," etc.

18. Know to include units when appropriate. Round answers if necessary or indicated.

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 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.