Advanced Algebra II Final Review

As we did for the mid-term, we will review one topic at a time, with you as the teachers. And once again, ***preparing for and teaching your class counts as a test grade.*** However, there are some important differences, so please read this carefully!

On Tuesday, May 12, your team will hand me four things. One partner should do the *review guide;* the other partner should do the *homework set, answer key, and lesson plan.*

1. A *review guide.* A review guide should tell people everything they need to know about your topic. It should include words (explaining the concepts), pictures (whenever possible), detailed worked-out problems (with explanations), and real-world examples (you can usually find good ones on the Web). A good review guide will probably fall in the range of 2-5 typed pages; I would be very surprised if you could do a complete job in less.
2. A *homework set* that I will copy and hand out to the class. This must have at least a few good "real world" types of word problems, except for the unit on Complex Numbers.
3. An *answer key for the homework set.* Not just answers, but carefully worked-out answers.
4. A *lesson plan.* This includes notes on what you are going to explain, including detailed worked-out problems, real life applications, and explanations of particularly tricky concepts.

All these materials are due to me Tuesday, May 12, *regardless of when you teach.* **I will take off one letter grade for every day that they are late.**

As always, the best way to figure out "what I'm looking for" for any particular topic is to look back at my old tests on these topics. I have copies of them, if you don't. However, I have also included here a brief guide that indicates what you want to focus on.

How to Spend the Last Two Weeks

Every day, you will have a homework to do, made up by one of your fellow classmates. But doing the homework is just the start. Also look over the topic! At a minimum, look over the test (or tests) I gave you on the topic. If possible, also look over the homework assignments, and/or read about the topic in the book. Figure out if you have any questions, and come in ready to ask them.

Make the most of each day—study that topic as if you will never study it again before the End-of-Course Exam (because, frankly, you won't). If each day you confidently master one topic, you will be in good shape. If you don't, and you try to cram for the EOC at the last day, your chances are not so good.

Topics We Are Not Reviewing

Due to time limitations, there are a few topics we are not reviewing at all. Please find the time to look over these, because *these will be on the end of course test.*

- Graphing lines ($y=mx+b$)
- Simultaneous Equations (solving them by graphing, substitution, and elimination, and also setting up $d=rt$ problems)
- Exponents (negative, fractional, and 0 exponents, and exponential functions—especially compound interest!)
- Radicals (simplifying them, and solving equations such as $2x+\sqrt{x+2}=2$)

Test	Teachers	Class Date
Functions (I & II)	Alpha (student name)	Tuesday, May 12
Inequalities and Absolute Values	Beta	Wednesday, May 13
Quadratic Functions (I & II)	Gamma	Thursday, May 14
Logs	Delta	Friday, May 15
Rational Expressions	Epsilon	Monday, May 18
Complex Numbers	Zeta	Tuesday, May 19
Matrices (I & II)	Eta	Wednesday, May 20
Data to Functions	Theta	Thursday, May 21
Conics	Iota	Friday, May 22

On the next page I give a bit more detail about what I mean by each of these topics, including notes about what you should focus more or less of your time on. But your best guides are the course-pack, and the test(s) on that particular topic.

<u>Functions I & II</u>	Briefly skim over: What is a function? What are the "independent" and "dependent" variables? What are the *domain* and *range* of a function? What is the *vertical line test?* But focus primarily on three things: *composite functions, inverse functions,* and *permutations of graphs.*
<u>Inequalities and Absolute Values</u>	Talk a bit about basic inequalities (-4x+12<20), and a bit about absolute value equations (2|x-3|=7, and |x-5|=2x-7, which are different cases). Then focus on the hard stuff, which is the two together (3|x+5|>12). In all cases, find the solution and graph it on a number line. Also discuss the "piecewise" definition of the absolute value, which can be used (for instance) to graph y=x+|x|.
<u>Quadratic Functions I & II</u>	Solving quadratic equations by: factoring, completing the square, and using the quadratic formula. How do you choose which one to use? Using the "discriminant" to see how many solutions there will be. Solving quadratic *inequalities.* (Don't spend too much time on graphing parabolas; we've done plenty of that.)
<u>Logs</u>	What is a logarithm? The logarithm as an inverse function of the exponential. The three rules of logarithms: what are they, and where do they come from? Graphing logarithms. The "common" and "natural" logs.
<u>Rational Expressions</u>	How do you add, subtract, multiply, and divide rational expressions? (This includes a bit on the rules of exponents, a lot on factoring, and a review of fractions!) How do you solve rational equations? How do you do polynomial "long division?"
<u>Complex Numbers</u>	What is *i?* What are $i^{2,3,4,5,etc}$? What are $\sqrt{-9}$ and $\sqrt{-8}$? What is a *complex number*? How do you add, subtract, multiply and divide them? What does it mean for two complex numbers to be equal to each other? How do you put something like $\dfrac{3}{2+5i}$ into a+b*i* format?
<u>Matrices I & II</u>	Don't spend much time, if any, on the easy stuff (adding, subtracting, multiplying by a number). Briefly remind people how to do matrices on the calculator. But mostly, focus on the good stuff: How do you multiply matrices? What is the identity matrix I? What is the inverse of a matrix, and how do you find it? What is a determinant, and how do you find it? How do you use matrices to solve systems of linear equations?
<u>Data to Functions</u>	What is "direct variation" and how do we recognize it? What is "inverse variation" and how do we recognize it? What happens if y is inversely proportional to x^2, or z is directly proportional to *both* x *and* y ("joint variation")? How do we use the calculator to find a (line, exponential curve, quadratic function, logarithmic function) to fit a given set of points?
<u>Conic Sections</u>	Given an equation $ax^2+by^2+cx+dy+e=0$, how do you identify it as: line, vertical parabola, horizontal parabola, circle, ellipse, or hyperbola? What are the standard forms for each of those shapes? How do you *complete the square* to put it in standard form? How do you graph each of those shapes? (Emphasize ellipses and hyperbolas, since they are the hard ones.)

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