

## MATH 313 REVIEW SHEET

Dec 7, 2006

This is not intended to be a comprehensive summary of the material we covered this semester in two pages. For a comprehensive review, you'll have to use your textbook and your class notes. Each chapter in the textbook ends with a review. I strongly recommend reviewing the exercises that were assigned for the homework.

The standard K-12 math curriculum is a prerequisite for this course. You cannot do well at college level mathematics if you don't know the K-12 material. You can find the California Mathematics Content Standards at [www.cde.ca.gov/be/st/ss/mthmain.asp](http://www.cde.ca.gov/be/st/ss/mthmain.asp). If you need to learn or relearn missing skills, the library is a good place to look for a reference. Here are a few websites that may also help:

- [www.themathpage.com](http://www.themathpage.com) covers many topics taught in high school math.
- [www.sosmath.com/algebra/algebra.html](http://www.sosmath.com/algebra/algebra.html) focuses on algebra.
- [www.wtamu.edu/academic/anns/mps/math/mathlab/col\\_algebra](http://www.wtamu.edu/academic/anns/mps/math/mathlab/col_algebra) also focuses on algebra. Don't let the name college algebra fool you, that's really a misnomer for high school algebra.
- [www.classzone.com/books/msmath2\\_na](http://www.classzone.com/books/msmath2_na) covers math taught in junior high school.

**When I say you should know something, it means that you should be able to explain how and why it works. Merely performing procedures will not be enough to do well on the final. You will be asked to give complete explanations of your work.**

Here are the topics we covered this semester:

### 1. Number theory

Terminology you should understand and be able to define and use correctly: divisor, factor, multiple, divisible, prime number, composite number, greatest common factor, least common multiple, relatively prime.

You should know the following:

- test if a number is prime,
- use Eratosthenes's Sieve to find prime numbers,
- the Fundamental Theorem of Arithmetic,
- find the factors of a number,
- find the prime factorization of a number,
- how and why the divisibility tests for 2, 3, 4, 5, 8, 9 work
- use the prime factorization to determine how many factors a number has,
- use the prime factorization to find the factors of a number,
- use the prime factorization to find the gcd and the lcm of numbers.

### 2. Relations

Terminology you should understand and be able to define and use correctly: related quantities, rate of change, slope, equation of a line, vertical intercept.

You should know the following:

- determine if two quantities are related and how they are related (increasing/decreasing relationships)
- construct a table, or a graph, or an algebraic equation that shows the relationship between two related quantities,
- read and understand a table, or a graph, or an equation that represents a relationship between quantities,

- find the slope of a straight line,
- the connection between slope and rate of change,
- find the equation of a straight line.

### 3. Relationships among time, distance, and rate

Terminology you should understand and be able to define and use correctly: position, distance, speed, velocity.

You should know the following:

- understand the connections among time, position, distance, and speed,
- understand the difference between qualitative and quantitative graphs,
- draw a position-time graph, a distance-time graph, or a speed-time graph based on a story,
- the connections, similarities, differences between the position-time graph, the distance-time graph, and the speed-time graph,
- construct a story from a position-time graph, a distance-time graph, or a speed-time graph.

### 4. Algebra

Terminology you should understand and be able to define and use correctly: rate of change, intersection of lines, commutativity, associativity, distributivity, additive inverse (negative), multiplicative inverse (reciprocal), polynomial.

You should know the following:

- read and understand graphs,
- solve algebraic problems using a table, or a graph, or an equation, or quantitative reasoning,
- the advantages and disadvantages of the four methods above,
- find a weighted average,
- what average means (no, it is not just a computational procedure),
- properties of the four basic arithmetic operations (addition, multiplication, subtraction, division) and how and why these properties allow you to do usual arithmetic,
- arithmetic (addition, multiplication, subtraction, division) with polynomials, how and why it works.