



## Mrs. Lamotte

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### ADVANCED MATH/PRE-CALCULUS A&B SYLLABUS

#### Course Description:

Advanced Math/Pre-Calculus is the study of relations; functions and their graphs; trigonometry; discrete math; and an introduction to the calculus concepts of derivatives and integrals.

#### Textbook:

*Glencoe: Advanced Mathematical Concepts (Pre-Calculus with Applications) © 2006*

Textbook chapter .pdf files will be posted on Google Classroom for your use. If you would like a textbook at home, simply visit the book room and request one.

#### Materials:

Graphing Calculator (TI 83+ or TI 84+ recommended), textbook, pencil, notebook or binder with lined paper, 3-ring binder or folder in which to keep assignments, etc.

#### Internet Resources:

Glencoe textbook: Chapters will be provided as .pdf files for each chapter.

Join Classroom 3<sup>rd</sup> Hour: j u 4 4 4 7 m

5<sup>th</sup> hour: 7 g j m b t

Join Remind 3<sup>rd</sup> and 5<sup>th</sup> hour: [remind.com/join/9cec773](https://remind.com/join/9cec773)

#### Graph Paper:

Free Online Graph Paper / Grid Paper PDFs including Square Grid Paper, Polar Grids, & Number Lines. <http://incompetech.com/graphpaper/>

## Expectations:

- Students will fully participate in classroom activities as set forth by the teacher.
- Students will have daily tasks that include:
  - Reading the textbook
  - Note taking and solving problems
  - Homework and practice
  - “Extra investigation” (i.e.: Google, YouTube searches, Quizlet, videos, etc.)
  - Asking questions of one another and of the teacher
  - Answering questions posed by peers
- Good communication is the key to success! TALK TO ME you are falling behind, need extra help, or just plain don’t understand something!

## Classroom Procedures:

- Warm-Ups:
  - In-class warm-ups will be utilized as a tool for preparation and informal assessment. Your warm-ups must stay in the classroom file except for days before tests.
- Note taking:
  - Presentation of new material will occur every day.
- Homework
  - Is a requirement and will be graded daily. Grading may consist of any combination of possibilities, including spot-checking problems, accuracy, or completeness.
  - If homework is late it can be turned in for full credit up until the day of the Chapter Test. After the test day, homework for that chapter is not accepted.
  - Homework is worth 5% in the calculation of your grade, and it is essential to practice the new skills you have learned and to master concepts required for the tests.
  - There is a big difference between **completing homework and doing homework to learn!** You’ll have access to homework answers; it is the unwise student who copies answers without the process of intellectual mastery of the content.
- If you are absent:
  - It is your responsibility to get the notes from someone else or complete them by following the book.
  - It is your obligation to ATTEMPT the assignment for that night (refer to the assignment sheet that is distributed at the beginning of each unit).
  - Any homework due during your absence is due the day you return.
  - If you are absent during a test or quiz, be prepared to take it immediately upon your return. In rare cases of sickness or an emergency, extensions will be permitted upon parent request.
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- *Please see the Department Guidelines for grading procedures, more about the attendance policy and retake criteria.*
- I am available for you to get extra help in several ways: check my website regularly. Join Remind.

## ADVANCED MATH/PRE-CALCULUS FIRST SEMESTER

### Major Course Outcomes: Chapters 1 – 4, 11, 12, and “Data Representations”

#### The learner will:

- Ch 1 - Linear Relations and Functions
  - Determine whether a given relation is a function and perform operations with functions.
  - Evaluate and find zeros of linear functions using functional notation.
  - Graph and write functions and inequalities.
  - Write equations of parallel and perpendicular lines.
  - Model data using scatter plots and write prediction equations.
- Ch 2 - Systems of Linear Equations and Inequalities
  - Solve systems of equations and inequalities.
  - Define matrices.
  - Add, subtract, and multiply matrices.
  - Use matrices to model transformations.
  - Find determinants and inverses of matrices.
  - Use linear programming to solve problems.
- Ch 3 - The Nature of Graphs
  - Graph functions, relations, inverses, and inequalities.
  - Analyze families of graphs.
  - Investigate symmetry, continuity, end behavior, and transformations of graphs.
  - Find asymptotes and extrema of functions.
  - Solve problems involving direct, inverse, and joint variation.
- Ch 4 - Polynomial and Rational Functions
  - Determine roots of polynomial equations.
  - Solve quadratic, rational, and radical equations and rational and radical inequalities.
  - Find the factors of polynomials.
  - Approximate real zeros of polynomial functions.
  - Write and interpret polynomial functions that model real-world data.
- Ch 11 – Exponential and Logarithmic Functions
  - Simplify and evaluate expressions containing rational and irrational exponents.
  - Use and graph exponential functions.
  - Evaluate expressions and graph and solve equations involving logarithms.
  - Model real-world data and solve problems using common and natural logarithms.
- Ch 12 – Sequences and Series
  - Identify and find the  $n$ th terms of arithmetic, geometric, and infinite sequences.
  - Find sums of arithmetic, geometric, and infinite sequences.
  - Determine whether a series is convergent or divergent.
  - Use sigma notation.
  - Use the Binomial Theorem to expand binomials.
  - Evaluate expressions using exponential, trigonometric, and iterative series.
  - Use mathematical induction to prove the validity of mathematical statements.
- Ch 14ish – Data Representations and Regressions
  - Make and use bar graphs, histograms, frequency distribution tables, stem-and-leaf plots, and box-and-whisker plots.
  - Find the measures of central tendency and the measures of variability.
  - Use the normal distribution curve.
  - Use data to determine a line of best fit (including, but not limited to: linear, quadratic, cubic, exponential, logarithmic, sinusoidal)

**ADVANCED MATH/PRE-CALCULUS  
SECOND SEMESTER  
Major Course Outcomes: Chapters 5 – 9, 15A, 15B**

**The learner will:**

- Ch 5 – The Trigonometric Functions
  - Convert decimal degree measures to degrees, minutes, and seconds, and vice versa.
  - Identify angles that are co-terminal with a given angle.
  - Solve triangles.
  - Find the values of trigonometric functions.
  - Find the areas of triangles.
- Ch 6 – Graphs of the Trigonometric Functions
  - Change from radian measure to degree measure, and vice versa.
  - Find linear and angular velocity.
  - Use and draw graphs of trigonometric functions and their inverses.
  - Find the amplitude, the period, the phase shift, and the vertical shift for trigonometric functions.
  - Write trigonometric equations to model a given situation.
- Ch 7 – Trigonometric Identities and Functions
  - Use reciprocal, quotient, Pythagorean, symmetry, and opposite-angle identities.
  - Verify trigonometric identities.
  - Use sum, difference, double-angle, and half-angle identities.
  - Solve trigonometric equations and inequalities.
  - Write linear equations in normal form.
  - Find the distance from a point to a line.
- Ch 8 – Vectors and Parametric Equations
  - Add, subtract, and multiply vectors.
  - Represent vectors as ordered pairs or ordered triples and determine their magnitudes.
  - Write and graph vector and parametric equations.
  - Use matrices to model transformations in three-dimensional space.
- Ch 9 – The Trigonometric Functions
  - Graph polar equations.
  - Convert between polar and rectangular coordinates.
  - Add, subtract, multiply, and divide complex numbers in rectangular and polar forms.
  - Convert between rectangular and polar forms of complex numbers.
  - Find powers and roots of complex numbers.
- Ch 15A – Derivatives
  - Evaluate limits of functions.
  - Find derivatives of polynomial functions using the power, product, quotient, and chain rules .
  - \*\* Note: This chapter will be heavily supplemented with outside materials!
- Ch 15B – Integrals
  - Find area under curves geometrically and using Riemann Sums.
  - Find anti-derivatives of polynomial functions.
  - Evaluate definite integrals using limits and the Fundamental Theorem of Calculus.
  - \*\* Note: This chapter will be heavily supplemented with outside materials!