Advanced Math / Pre-Calculus Syllabus

Mr. Klassen North A228

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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
If you would like a textbook at home, simply visit the library and request one.

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

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:
  - 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.
  - Please have a spiral notebook for your warm-ups.

- Note taking:
  - Presentation of new material will occur every day.
  - Some notes may be flipped, which means they will be taken on your own at night by watching videos and then discussed in class.

- Homework
  - It is a requirement. Grading may consist of any combination of possibilities, including spot-checking problems, accuracy, or completeness.
  - **All homework must be completed by the time you take the test.**
  - Homework is worth 20% in the calculation of your grade, and **it is <u>essential</u> to practice the new skills you have learned and to <u>master concepts</u> 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:
  - **COMMUNICATE!.**
  - It is ***your responsibility*** to get the notes from Mr. Klassen's YouTube channel.
  - It is ***your obligation*** to ATTEMPT the assignment for that night (email Mr. Klassen to find out what the assignment is).
  - Any homework due during your absence is due <u>the day you return</u>.
  - **<u>If you are absent during a test or quiz, be prepared to take it immediately upon your return</u>**. In rare cases of sickness or an emergency, extensions will be permitted upon parent request.

- ***Please see the Department Guidelines on my website, which is listed at the top of this syllabus, for grading procedures, more about the attendance policy and retake criteria*.**

- Due to COVID-19 safety protocols, I am unable to help students before or after school. When this changes, I will be sure to let you know. However, please let me know if you're struggling and we can try some creative problem solving to help you out. **I also highly recommend making a friend in class that you can text or video chat with outside of school as you study.**

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.

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!

Classroom Electronics Expectations

- Bell to bell no cell!
    - No phones from the tardy bell to the end of class bell
    - The bell is the warning for cell phones to be put away
    - This includes if you leave the room with the pass.
- Earbuds and Smart Watches
    - Earbuds are not allowed unless the teacher gives special permission (i.e. Watching video lessons on your Chromebook)
    - If smart watches are a distraction, you may be asked to remove it
        - Smart watches need to be removed during assessments

Behavior Consequences

Behavior	1st offense	2nd offense	3rd offense	4th offense
Cell phone use without permission in class	Phone to office; student pick up at end of school day	Phone to office; parent pick up at end of school day	Phone to office; parent pick up at end of school day	Phone to office; parent pick up at end of school day; Thursday night school assigned

What to do with Phone
Students need to keep their phone inside of their backpack during class time. I would discourage you from keeping your phone in your pocket as it's tempting to pull it out without even thinking, resulting in loss of your phone for the rest of the day and the need to have your parent pick it up. During assessments, all phones and smart watches must be in your backpack for the entire hour.

What About Chromebooks
We will be using our Chromebook throughout the course. Chromebooks are to be used for educational purposes. If you're distracted by your Chromebook, you may be asked to put it away. It is your responsibility to make sure you have a **charged** Chromebook with you daily.

PHASE 3 REMOTE LEARNING EXPECTATIONS
If West Ottawa moves into phase 3 learning, students should reference the West Ottawa Safe Schools Handbook, "Phase 3/Closure" section. Students can expect to watch instructional videos and complete online activities/assignments during asynchronous learning. During synchronous learning, students will interact with their teacher and classmates via Google Meet sessions. Students will have opportunities to ask questions about assignments worked on during asynchronous time and work collaboratively with peers on learning activities. Attendance will be recorded during phase 3, and assignments/tests will impact students' semester grade.