Honors Calculus
Instructor: Maria Branco, maria.branco@npsd.k12.ri.us
School Year: 2020-2021

Syllabus

Course Description:
This course will introduce the student to the study of elementary functions, the concepts of analytic geometry and the principles of differential and integral calculus. Equal emphasis is placed upon theory and application. This course is taught at an intense level comparable to Honor courses offered at North Providence High School and is treated as such for grading purposes. It is the equivalent to a first semester college level calculus course.

Required Text:
- Calculus of a Single Variable, 9th Ed. 2010, Larson, Edwards., Cengage Learning
- Online Textbook through WebAssign.com
  WebAssign.com
  Class key for Web Assign   northprovidence.ri 5598 6510

Online Required Accounts:

Deltamath.com
Instructions to access summer assignment:
1. Log onto deltamath.com
2. Click in the upper right hand corner on "Create Account" for Student
3. Use teacher code 254016
4. Add your class from the drop down menu - Honors Calculus
5. Create account with your name and email
6. Once the account is created, you will see assignments that need to be completed.
7. There are **THREE QUIZZES (#2 is double count)**

Google Classroom
Code: 2BRV25D

Course requirements
Each chapter will include readings, questions from the text, quizzes, tests, projects, group assignments, oral presentations, and real life applications. There will be a midterm and a final exam.

Grading Policy:
- Summative (Tests, Projects)   40%
- Interim Assessments (Quizzes)   35%
- Course Assignments (POWs, Group Problems, Online Assignments)   15%
- Homework   10%
- Exams will be part of semester averages; **all students are required to take a mid-term and final exam**

Technology Requirement:
- I will be using a Texas Instrument (TI-84 Plus CE) in class regularly. The calculator will facilitate conducting explorations, graphing functions, solving equations numerically, analyzing and interpreting results, and justifying and explaining results of graphs and equations. The calculator will **not** be allowed on ALL assessments.

Homework & Makeup Policy:
- Homework will be assigned on a regular basis. All homework assignments are due the following class meeting unless otherwise stated (NO EXCEPTIONS!). Homework is checked at the beginning of the class and will **not be accepted during, end, or after class unless it was an absence.**
- When students are absent, it is the responsibility of the student to get all missed material and assignments. Do not interrupt the class for missed work.
- **If you are absent the day before an assessment and know about the assessment and return the following day, you are still responsible for taking the assessment at that time (NO EXCEPTIONS!)**
- Due to the fast pace and depth of the material in the course, it is expected that you are in class every day unless you are seriously ill.

Goals:
By successfully completing this course, you will be able to:
- Work with functions represented in a variety of ways and understand the connections among these representations.
- Understand the meaning of the derivative in terms of a rate of change and locate linear approximation, and use derivatives to solve a variety of problems.
- Understand the relationship between the derivative and the definite integral as expressed in both parts of the Fundamental Theorem of Calculus.
- Communicate mathematics both orally and in well-written sentences to explain solutions to problems.
- Model a written description of a physical situation with a function, a differential equation, or an integral.
- Determine the reasonableness of solutions, including sign, size, relative accuracy, and units of measurement.
- Develop an appreciation of calculus as a coherent body of knowledge and as a human accomplishment.
- Use technology to help solve problems, experiment, interpret results, and verify conclusions.

Supplies:
- notebook or filler paper
- binder to hold 3 hole punch notes
- graphing calculator (preferable), please see me if you need a calculator

Course Outline
Chapter P-Preparation for Calculus *summer assignment*
        Graphs and Models
        Linear models and rates of change
        Functions and their graphs

Fitting models to data

Chapter 1-Limits and Their Properties
        A preview of Calculus
        Finding Limits Graphically and Numerically
        Evaluating Limits Analytically
        Continuity and One-Sided Limits
        Infinite Limits

Chapter 2-Differentiation
        The Derivative and the Tangent Line Problem
        Basic Differentiation Rules and Rates of Change
        Product and Quotient Rules and Higher-Order Derivative
        The Chain Rule
        Implicit Differentiation
        Related Rates
        The Natural Logarithmic Function: Differentiation
        Inverse Functions
        Exponential Functions: Differentiation
        Inverse Trigonometric Functions: Differentiation
        Bases Other than e and Applications

Chapter 3-Applications of Differentiation
        Extrema on an Interval
        Rolle's Theorem and the Mean Value Theorem
        Increasing and Decreasing Functions and the First Derivative Test
        Concavity and the Second Derivative Test
        Limits at Infinity
        A summary of Curve Sketching
        Optimization Problems
        Newton's Method
        Differentials

Chapter 4-Integration
        Anti-derivatives and Indefinite Integration
        Area
        Riemann Sums and Definite Integrals
        The Fundamental Theorem of Calculus
        Integration by Substitution
        Numerical Integration

Chapter 5-Logarithmic, Exponential, and Other Transcendental Functions
        The Natural Logarithmic Function: Integration
        Inverse Functions
        Exponential Functions: Integration
        Bases Other than e and Applications
        Inverse Trigonometric Functions: Integration

Honors Calculus Summer Assignments 2020

Getting Started with WebAssign	online tutorial on WebAssign.com	due 6/15/20 on webassign
Calculus PreTest	online	due date on webassign
Chapter P Section 1 Graphs and Models	Read **Additional if needed**, Page 8 1-10all, 13, 19,21,29,63,65	due date on webassign
Chapter P Section 2 Linear Models and Rates of Change	Read **Additional if needed**, Page 16 1-7all, 14,19,21b,22b,23-28,29,45, 46	due date on webassign
Chapter P Section 3 Functions and Their Graphs	Read **Additional if needed**, Page 27 1-3,8,13-16,22,27,28, 30-35,39,41,44,45,46,49-54,61-66,75, 97ab	due date on webassign
Chapter P Section 4 Fitting Models to Data	Read	due date on webassign
Test Chapter P		**9/8/20 (during class)**

- Keep a binder with notes from Calculus sections

- Each assignment has approximately a 2-3 week window. Pace yourself accordingly. Practice the skills and concept required or you will be at a disadvantage at the beginning of the year. You are able to set a reminder on WebAssign for due dates.

- Complete and sign the classroom expectation sheet attached with **the school email** that you will use frequently for teacher notes and notifications through Google Drive. It is the student's responsibility to manage their school email through the summer and throughout the year.

- If you lose this syllabus, there is a copy on the school department website.

- Good Luck and have a great summer!

Special Tests for the Symmetry of a Graph

Type of Symmetry	Example
Symmetry in the x-axis *Meaning*: $(x, -y)$ is on the graph whenever (x, y) is. *Testing an equation of a graph*: In the equation, leave x alone and substitute $-y$ for y. Does an equivalent equation result?	$y^2x = 1$ $(-y)^2x = 1$ equivalent
Symmetry in the y-axis *Meaning*: $(-x, y)$ is on the graph whenever (x, y) is. *Testing an equation of a graph*: In the equation, substitute $-x$ for x and leave y alone. Does an equivalent equation result?	$y = x^2$ $y = (-x)^2$ equivalent
Symmetry in the line $y = x$ *Meaning*: (y, x) is on the graph whenever (x, y) is. *Testing an equation of a graph*: In the equation, interchange x and y. Does an equivalent equation result?	$x^3 + y^3 = 1$ $y^3 + x^3 = 1$ equivalent
Symmetry in the origin *Meaning*: $(-x, -y)$ is on the graph whenever (x, y) is. *Testing an equation of a graph*: In the equation, substitute $-x$ for x and $-y$ for y. Does an equivalent equation result?	$y = x^3$ $-y = (-x)^3$ equivalent

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Honors Calculus STUDENT CONTRACT
Please fill out the following information <u>accurately and clearly</u>

Carefully read each of the following contract terms. <u>INITIAL each item in the space provided</u>. When finished, *both YOU and your PARENT must sign and date the contract*.

_____ I have read the ENTIRE course syllabus and understand that every part of the syllabus pertains to me; I know that I will be held directly and immediately accountable for my actions should I choose to violate or ignore any of those provisions.

_____ I understand that this is a college level course with college-level expectations, and I understand that my work will be held to a college-level standard. I understand the class will be rigorous and move quickly through the required curriculum.

_____ I understand that the teacher is available to help me during Coaching.

_____ I will read the text as assigned, I will take notes on the chapters, and I will bring the book to class when asked to do so by the teacher.

_____ I will not cut/or intentionally be absent from this class to avoid taking tests.

_____ I will make up or turn in missed tests/work by email &/or the next day even if I don't have this class, and I understand the penalties for work marked late.

_____ I will complete the Summer Assignment by the assigned deadlines on Webassign or DeltaMath.

_____ I will behave appropriately in class, treating the teacher and my fellow students with respect. I understand that failure to do so will result in disciplinary action per the NPHS Student Handbook.

_____ **I understand the standards for academic and participation grades, especially those that pertain to academic dishonesty/plagiarism and absences; I understand the consequences for academic dishonesty/plagiarism, and for failure to make up work or tests due to absences.**

_____ **I have technology and wifi to be able to complete my assignments, enabling camera and audio for assessments.**

_____ I understand that by signing off on this contract, I *cannot* drop this course after the **last day of school which is June 15, 2020.**

By signing this contract, you verify that you have read and understand the student contract, course syllabus, and summer assignments and deadlines:

STUDENT:
Printed Name: _____Signature _____

Date: _____

PARENT:
Printed Name: _____Signature _____

Date: _____