

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

Chapter 6-Differential Equations

Slope Fields
Differential Equations: Growth and Decay
Separation of Variables and the Logistic Equation

Honors Calculus Summer Assignments 2018

Getting Started with WebAssign	online tutorial on WebAssign.com	due 6/22/18 on webassign
Calculus PreTest	online	on webassign
Chapter P Section 1 Graphs and Models	Read Additional if needed, Page 8 1-10all, 13, 19,21,29,63,65	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	on webassign
Chapter P Section 3 Functions and Their Graphs	Read Additional if needed, Page 27 1-3,8,13-16,22,27,28, 30-35,39,41,44,45,46,49-5 4,61-66,75, 97ab	on webassign
Chapter P Section 4 Fitting Models to Data	Read Online AND Complete P4 Worksheet attached in packet	on webassign and submit attached worksheet 1st day of school during class
Test Chapter P		Aug 31, 2018 (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.
- 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 website, <http://npsd.k12.ri.us/nphs/> under "Academics."
- Good Luck and have a great summer!

6. A student drives in a 10 minute trip to school. Its coordinates are: (0,0), (4,2), (6,2), and (10,6). Plot the graph. Give a verbal description of characteristics of the student's drive to school.

7. The table shows the enrollment in a liberal arts college for the years 1988 to 1995.

Year	1988	1989	1990	1991	1992	1993	1994	1995
Enrollment	1675	1704	1710	1768	1833	1918	1967	1972

- plot the data
- choose two points from the data and use these to find a linear model for the data
- Use the model to predict the enrollment for the year 2010.

Special Tests for the Symmetry of a Graph

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

Honors Calculus STUDENT CONTRACT

Please fill out the following information accurately and clearly

Carefully read each of the following contract terms. INITIAL each item in the space provided. 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 (by appointment) 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 through textbook.

_____ 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 cheating/plagiarism and absences; I understand the consequences for cheating/plagiarism, and for failure to make up work or tests due to absences.

_____ I understand that by signing off on this contract, I **cannot** drop this course after the **last day of school which is June 18, 2018.**

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: _____