

Calculus

Edgerton

Essential Questions

- How are displacement, velocity, and acceleration related?
- How is optimization of a process or product attained?
- How is mathematics, in general, and calculus in particular, a part of daily life?

Course Description

This course intends to extend students' mathematical understanding and expose them to the philosophy, techniques, and concepts of calculus. Students may take the AP Calculus AB exam near the end of the course even though the class is not intended to prepare them for the test and this class will not cover all tested topics. Students will explore a mixture of both familiar and new material. Data analysis, mathematical modeling, and problem solving will be employed throughout the course. Diverse mathematical applications will introduce, connect, and extend the course content. Directed writing and instructional technology will also be used to expand students' ability to communicate mathematically and broaden conceptually.

Prerequisites

- Completion pre-calculus with understanding of algebra, geometry, trigonometry, analytic geometry, and elementary functions (including linear, polynomial, rational, exponential, logarithmic, trigonometric, inverse trigonometric, and piecewise functions).
- Familiarity with the language and properties of functions, the algebra of functions, and the graphs of functions. Students must also understand the basics of functional relationships (domain and range, odd and even, periodic, symmetry, zeros, intercepts, and so on).
- Know the values of the trigonometric functions for 0 , $\pi/6$, $\pi/4$, $\pi/3$, $\pi/2$, and their multiples.
- Persistence and integrity.

Course Topics

- Functions, graphs, and limits.
- Derivatives and Integrals.
- Areas and volumes.
- Optimization.
- Inverse functions.

Criteria Used to Determine Grades

Students earn points from homework, daily journal writing, projects, quizzes (formative evaluations), and tests (summative examinations). Weighting will be as follows

70% – Assessments (tests, quizzes and projects)

10% – Assignments (class activities and homework)

10% – Journal (to be done in hardbound composition book only—no spiral notebooks!)

10% – Class work, please see details on the GRADING page

Required Materials/Equipment

- Your school-issued laptop computer, charged!
- Two (2) hardbound theme books (i.e. *Mead Composition Book*) for journaling (no spirals!).
- Texas Instruments TI-83⁺ (or TI-84⁺) Graphing Calculator + extra AAA cells.
- Basic drawing supplies (ruler that measures in centimeters, compass, protractor).
- Several pencils or mechanical pencil with extra lead + a pen (for journal writing; NOT red ink).

Special notes: miscellaneous electronic devices (e.g. cell phones, music players), food, gum, and beverages (except for water in a sealable bottle) are prohibited in the classroom!!!

Contact Information: Richard.Edgerton@highlineschools.org

See edgertonphd.us/rahs (for directory to the class' assessments, activities, assignments, etc.).

ATTENDANCE

Consistent, punctual attendance is essential to learning. The following guidelines are given to emphasize this importance and to clarify your consequences and responsibilities with regard to absences and tardiness.

1. You are tardy if you are not in your assigned seat at the time class is scheduled to begin. Detention begins on the third tardy per quarter, referral to Mr. Holloway on the fifth.
2. Tardiness of more than ten (10) minutes will be recorded as an absence. You must check in with the attendance secretary before being admitted to class.
3. Work from a day on which you have an unexcused absence will **not** be accepted *under any circumstances*. This includes assignments, projects, quizzes, and tests!
4. When returning from an absence, make sure that your absence is excused according to school policy. Hand in your missing work as soon as possible, including the ETs. Be aware there are several ways you should know what work is assigned!!!!
5. Pre-arranged absences are allowed with the understanding that all assignments, activities, projects, and assessments are to be submitted **on the day they are due for the rest of the class**. Please make arrangements before your departure. This means you do NOT get extra time because of your pre-arranged absence!
6. You may be excused to work with another teacher **only if** you:
 - a) bring a signed, dated note from the other teacher stating the reason you are needed.
 - b) submit all work that is due for you.
 - c) confirm understanding of the day's assignment or activity.
 - d) accomplish all the above *before* class begins.
7. Due to the varied difficulties in activities, special materials will be available for at most two days after the class has completed an activity (occasionally online for longer). This also applies to those who miss an activity because of pre-arranged absences. NO alternative activities will be provided for those missed.
8. Since rapid feedback enhances learning, a limit on the make-up of assessments is necessary. A quiz must be made up within one day of its administration. With tests, one day is allowed for each day of absence (as in #4 above) up to a maximum of three days from the test date. To be allowed to make up an assessment, you must fill out the "Missed Assessment" form after agreeing upon a test date with me (you must also keep the appointment!). Assessments that are not made up within the prescribed timeframe receive a score of zero. Check the Website (edgertonphd.us/rahs) for activities, assignments, assessments, etc.
9. Students accumulating eleven (11) absences (of any type) in a semester will receive an "F" grade. All school and district rules regarding attendance will be followed.
10. Remember that consistent attendance is essential to academic achievement and often carefully scrutinized by prospective employers and colleges!

ASSIGNMENTS

1. Your homework must have the following to be accepted:
 - a) written in hardbound theme book, entered in chronological order.
 - b) the date of the assignment (when it was assigned, not when due or when you did it).
 - c) a description of the assignment (page, which problems, etc.).
 - d) legible writing hand and in a color other than red (either pencil or pen is OK on papers, work done in the journal *must* be in permanent ink).
2. Your work will be counted as “late” if submitted for scoring any time after papers have been checked or collected. This includes journals not available when they are scored (about every week). Late work is worth *no more* than half credit and must be submitted by the date of the associated in-class unit test. No late papers will be accepted during the last five school days of a grading period. Consult the page called “Attendance” for details concerning excused and pre-arranged absences. Assignments will not be accepted from days you have an unexcused absence!
3. Give explicit credit for any assistance you receive using acceptable formatting conventions. This means list Website URLs, names of those who gave suggestions along with what they contributed, etc. Under NO circumstances should you EVER copy another person’s work!!!
4. Every assignment problem must have these parts to receive credit:
 - a) the “facts” of the question (except on “worksheets”).
 - b) any accompanying diagram(s) used in the solution.
 - c) all steps leading to the solution (including trials for “guess and check”).
 - d) a clear indication of the solution, including an explanation and appropriate units.
 - e) a neat arrangement of your work.
 - g) your best attempt to solve each problem that was assigned (leave NO blanks!).
 - h) an explicit answer, including units. This means all problems that are word-based **MUST** provide a word-based (e.g. a sentence) answer. Drawing a box or oval around some numbers on the paper will not count as an explicit answer!

Under no circumstances will a paper with nothing but answers be accepted!
5. Scoring for a paper will be deferred and marked *incomplete* if it reveals conceptual misunderstanding. No substantial deduction will be assessed to papers that are completed in a timely manner (e.g. within one week), performed as expected, and include the original work. Papers that have been scored may not be returned to be re-scored.
6. Each day an “ET” (entry task) will be on the overhead. Write the ET and your response on your paper on its due date. ETs contribute to your understanding and the assignment’s value.
7. Class concludes with a “reflection” to be addressed in your journal. Your responses must be written in a hardbound composition book (no spiral notebooks!) and will be read regularly.
8. Errors are considered a normal part of extending one’s knowledge. Remember, if you are not making mistakes you aren’t trying hard enough! All thoughts, calculations, ideas, solution possibilities, etc. should remain (although crossed out) to provide you and me an opportunity to see previous ideas and learn from them.
9. Keep track of your progress by checking and sharing your progress reports (online in your *Illuminate* account). Knowing your standing in the class is *your* responsibility!

Extra credit—limited to:

Schedule and appear for an “extra credit appointment” within the first five weeks of a quarter. You may schedule one per quarter and the appointment cannot be made the same day as scheduled. There is a penalty for not appearing as scheduled. Use the EC APPOINTMENT form on the clipboard at the front of the classroom. Value: 10 points added to the *Homework* category.

GRADING

Your grade will be determined by comparing your point total with the “grade base” for the class using weighing on page 1 of this syllabus. Students earn points from homework, daily journal writing, projects, quizzes (formative evaluations), and tests (summative examinations). All of these methods of earning points contribute to the grade base with the exception of extra credit (explained separately). A *semester project* will be due by the final week of the semester. Be sure to watch for the announcement of the project! You must meet standard on all parts of the project for your submission to be acceptable. Quarter and semester grades will be assigned using the following percentages:

90% ⁺ and successfully completing semester project.....	A
80% ⁺ and successfully completing semester project.....	B
70% ⁺ and successfully completing semester project.....	C
60% ⁺ and successfully completing semester project.....	D
below 60% or not successfully completing semester project.....	F

Remember to check my Website (edgertonphd.us/rahs) for assessments, activities, assignments, entry tasks, journal prompts, etc. (check progress online in your *Illuminate* account). Remaining aware will help you avoid surprises at grading time!

Preparation and Participation score

Research and good sense suggests learning is optimized when the student arrives to class ready to participate and engages in the activity. The following are the items for which students receive their daily “Preparation and Participation” score.

- Readiness to work (includes punctuality and having proper materials). Be in your assigned seat by the time class begins, leave your backpack (with cell phone!) against the North or South wall, get your journal from the file cabinet, and open your homework notebook to the previous nights assignment.
- Completion of “Entry Task” within first 5 minutes of class.
- Participation in class activities.
- Quality of collaboration in group work.
- Silently writing a response to the JR during the last five minutes of class.

Students may also earn additional P & P points by volunteering to demonstrate problems (when the opportunity is offered). Similarly, students earn a zero for P & P for a dress code or technology violation, bringing beverages other than water in a sealable bottle into the classroom, chewing gum, or engaging in disrespectful behavior.

COMPUTER USE POLICY

Check whether your computer is required for the class before opening it.

Use ONLY your District-issued laptop computer. NO PERSONAL TECHNOLOGY!!!

Follow all District *Use and Responsibility* guidelines.

Bring your computer charged—no recharging during class.

Enter and leave respectfully.

Link ONLY to the school network. NO PERSONAL HOTSPOTS!!!

No off-task computing (e.g. playing games or email).

Spend no more than five minutes troubleshooting a problem.

Store files on the network rather than “your” school-issued laptop.

Close the lid of your laptop within five seconds of its announcement.

ASSESSMENTS

Assessments will be of one of two forms: *formative* and *summative*. Quizzes are *formative* in nature because they occur during the study of material and help in developing understanding in addition to providing information on student understanding. They also have less impact on students' scores than summative exams. Expect a quiz each week. *Summative* assessments (chapter tests and final exams) are comprehensive, less frequent, and carry more weight. All assessments must be completed during one "sitting" (you may not leave and return to finish it later) and restroom breaks are not allowed. Expect a test about every month and final exams at the end of each semester. Scores are what you get—there will be no retakes.

If you miss a test due to an excused absence, it must be made up within three days of the assessment date with the understanding that you have only one day for each day you were absent. Quizzes must be made up no later than the next class day. Students missing an assessment due to arranged absences must take the assessment *before* their departure. To make up a missed assessment, fill out the "MISSED ASSESSMENT" form (found on the clipboard at the front of the classroom) and hand it in to reserve a time and date. **Failure to submit missed assessment form on your return to class nullifies your opportunity to make up the assessment. If you miss your appointment you forfeit the opportunity to take the test!** Please note that no credit will be given for tests not taken. As stated in the attendance policy, tests and quizzes missed because of unexcused absences may not be made up.

Leaving your seat without permission, having a device capable of electronic communication on your person (e.g. cell phone, smart watch, etc.), talking to another student, or looking at another person's paper during an assessment results in a zero for all parties involved (yes, this means for allowing someone to see your paper!) and will be referred as appropriate. Cheating and other related transgressions are serious!

Assessments in this class are written to be *authentic*—representative of real-world situations. Because of this, you are usually allowed a 3x5 note card, drawing materials, and YOUR calculator unless stated otherwise. The content of most assessments will be posted on the Website at least a day before the assessment. Prepare yourself accordingly!

Assessments will be "scale scored" so that the numerical value awarded represents the judged amount of understanding displayed on the paper. To receive full credit for a problem you **MUST** write legibly, include all reasonable steps to the solution, and explicitly report the answer—this includes phrasing in a sentence, using the appropriate number of significant figures, and appropriate units. Answers without supportive work, whether correct or not, will be treated like a guess and will be awarded at most 20% of the value of the question.

The use of music devices during assessments

Recent research suggests performance is often enhanced when the test-taker listens to (background) music. Students may listen to sound-reproducing devices during assessments only if the device: only plays music (is not a cell phone, computer, etc.); is kept in sight (e.g. on the table) during the assessment; cannot be heard by anyone else; allows the user to hear alerts & announcements; and, is put away when the assessment is finished.

Summary

Success on assessments will depend on your preparation and ability to remain agile in problem situations. Working extra problems, rehearsing procedures, and extinguishing areas of weakness will enhance your performance and build resistance to "brain cramps."

Plagiarism

According to the RAHS *Student Handbook* (page 10) “Plagiarism is a form of cheating in which another person’s words or ideas are presented as your own. When you plagiarize, you steal another person’s work without giving credit to the work’s author, whether the source from which you took the words or ideas is a book, a television program, an interview, the Internet, or any other source. Plagiarism is a serious academic offense; at the college level, it typically results in expulsion. Raisbeck Aviation High School holds academic honesty to be an essential component of our school culture.”

Purdue University’s Online Writing Laboratory (<https://owl.english.purdue.edu/owl/>) features *Preventing Plagiarism* as one of its resource areas. OWL lists the following common types of plagiarism

- Excessive repetition (poor paraphrasing of another’s words)
- Improper citation (failure to cite properly)
- Improper idea borrowing (failure to cite another’s ideas)
- Fraud (creation of false sources)
- Forgery (turning in another person’s work as your own)

Please consider the following guidance on identifying and avoiding *Improper Citation*, *Improper Idea Borrowing*, and *Forgery*.

Improper Citation

- Identifying characteristics: Missing, incomplete, or incorrect citation, either intentionally or unintentionally, of any source of text, media, etc. used in an assignment, assessment, report, project, or paper.
- Remedy: Follow the specified style sheet (e.g. APA or MLA) to both identify the source where it is placed in your document and give the full reference on your “Works Cited” or “References” page. If a style sheet is not specified, follow the rules of the one you know. Example: use the full URL of a Website.

Improper Idea Borrowing

- Identifying characteristics: Ideas, concepts, thoughts, or insights gained from media, conversations, demonstrations, lectures, friends, family, tutors, etc.
- Remedy: Follow the specified style sheet if one can be applied, otherwise state who, when, and what the other person contributed. For example, help received on a homework problem would be addressed with a statement like “Trillian helped me with question 2. b) by showing me how to complete the square so I could factor the polynomial.”

Forgery

- Identifying characteristics: Copying another person’s work, either by scan, photo copy, by hand, or any other method. Merely stating “I copied this from ____...” does not absolve the copier from the commission of plagiarism.
- Remedy: Do not copy!

The Owl further specifies “Collaborative Authorship” as a common form of plagiarism. Note that “working together” assumes sharing the responsibilities of the work performed—specifying what part each person performed is your responsibility; otherwise, you have violated at least one of the forms above. Please realise that this is commonly referred to as “working together” or “helping” so failure to report *Collaborative Authorship* is a breach of academic integrity (see the example under *Improper Idea Borrowing* for an example of how to document “help”).

JOURNALS

This class is designed so that each session concludes with a “reflection” to be addressed in your journal. Your responses connect, summarize, and/or extend the day’s lesson. Journal Responses (JRs) contribute to your class grade and will be read several times during the quarter.

Journals and their associated entries must conform to the following

- Use a hardbound theme book (i.e. *Mead Composition Book*) for journaling.
- Write honest, complete responses to each prompt. The expectation is you will write for five minutes at the end of each class period.
- Date each entry.
- Use ink.
- Leave your journal in the classroom.
- Take your journal out of the file cabinet drawer when you enter the classroom. Neatly replace your journal in the appropriate space for your class at the end of class as you depart the room at the end of class.
- Write JRs ONLY (no ETs, homework problems, notes, etc.).
- Conserve space by writing as many entries per page as practical.
- Write clearly using only one side of a sheet.
- Avoid defacing your journal (e.g. tearing our pages, scribbling, etc.).
- Personalize the front of your journal to make it easy to identify.

CALCULATORS

This course requires all students to own a graphing calculator (e.g. TI-84⁺, or other AP-approved calculator). These devices enhance students' learning and provide access to mathematical power. Learn how to use your calculator and bring it to class every day!

A new TI-84⁺ costs about \$90 and is currently available at several stores at substantially less. Please check adds for the best deals—likely vendors are Amazon, K-Mart, Target, Staples, Fred Meyer, and Office Max. Although excellent deals are often available on eBay, remember to exercise caution whenever purchasing from an unknown person.

Suggestions

- Always keep it in your possession (avoid “loaning” it to another student).
- Personalize it with paint and engraving. Make your calculator unique!
- Do NOT install games on your calculator.
- Carry fresh AAA cells (at least four of them!) especially during assessments.

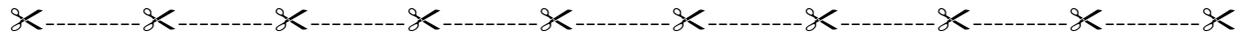
“Edge”

Richard.Edgerton@highlineschools.org
edgertonphd.us/rahs

Please clip, sign, and return this portion immediately to signify receiving the syllabus packet.

Keep this packet with you the first few days of the term—we will have quizzes over it!

Please detach and return the sheet below.



Student's name: _____ Period: _____

Please check the pages you reviewed in the *Syllabus* packet.

- | | |
|---|--------------------------------------|
| <input type="checkbox"/> Course syllabus (first page) | <input type="checkbox"/> Assessments |
| <input type="checkbox"/> Attendance | <input type="checkbox"/> Plagiarism |
| <input type="checkbox"/> Assignments | <input type="checkbox"/> Journals |
| <input type="checkbox"/> Grading & Computer Use | <input type="checkbox"/> Calculator |

I realize we may check the Website (edgertonphd.us/rahs) for assessments, activities, assignments, etc. (grades and scores are online in our *Illuminate* account).

Signed:

Student Parent Date

Parent name(s): _____

Telephone number(s): _____

Parent email address(s): _____