

# AP CALCULUS AB

Room 305

Mr. Spring

**Available:** Periods 2, 3 and 7 are free.  
Any day after school as long as I have a days notice.

**Goal:**

To do well on the AP Calculus AB exam on TUESDAY May 5<sup>th</sup> ☺

**Wilby's Core Values and Beliefs:**

The students, faculty, staff, and administration of Wilby High School will work cooperatively with families, members of the community, and the Board of Education to create a safe, welcoming, and academic environment which embraces, challenges, and nurtures the diverse talents, interests, and learning styles of every student. All students will leave Wilby High School with the self-respect, respect for others, knowledge, and skills necessary to become independent, intellectually curious, and self-fulfilled members of society.

**21st Century Learning Expectations:**

*Academic* – Effective Reader      Effective Writer      Effective Problem Solver      Self-Directed Learner  
*Social* – Respectful Person      Collaborative and Cooperative Worker  
*Civic* – Community Contributor

**AP Exam:**

The AP Calculus AB exam consists of four parts:

- Part 1: 28 Multiple Choice – No Calculator – 55 Minutes
- Part 2: 17 Multiple Choice – Calculator OK – 50 Minutes
- Part 3: 4 Open Response – No Calculator – 60 Minutes
- Part 4: 2 Open Response – Calculator OK – 30 Minutes

The AP Calculus AB exam test scoring is approximately:

- 70% of max = 5
- 60% of max. = 4
- 50% of max = 3

Some helpful hints about the AP Calculus AB exam:

- Students can put anything they want in their calculators (i.e. formulas are OK)
- All trig problems are in radian mode
- If decimal places are used, round to 3 places
- Four and only four types of applications are possible on the exam: distance traveled, area, volume, and average rate
- Use appropriate units in your answers
- Test questions are written by individuals and are reviewed for acceptance by a committee
- Open-response scoring standards are established by a committee of 10 people
- Two people correct each Open Response problem. If a dispute occurs in scoring, then the table leader reads the problem.
- Multiple Choice questions are scored Right or Wrong....PERIOD
- Problems get harder as you go (#1 is easier than #28)

## Course Structure:

Below is a list of topics put out by the AP Board. I have noted *tentative* goal markers. Note that, as the year progresses, we may discuss various topics out of this order.

### I. Precalculus

- Linear Functions
- Composite Functions
- Exponential Functions
- Inverse Functions including Logarithmic Functions
- Trigonometric Functions

### II. Limits and Continuity

- Average and Instantaneous Rate of Change
- Definition and Properties of Limits
- Limits Involving Infinity
- Continuity
- Rates of Change and Tangent Lines

### III. The Derivative

- Definition of the Derivative
- Relationship Between the Graphs of  $f$  and  $f'$
- Local Linearity
- Differentiability
- Differentiability Implies Continuity
- Differentiation of Polynomial Functions
- Product and Quotient Rule
- Velocity, Acceleration, and Other Rates of Change Including Rectilinear Motion
- Derivatives of Trigonometric Functions
- Chain Rule
- Implicit Differentiation

**END OF TERM I**

**10/28**

- Derivatives of Inverse Trigonometric Functions
- Derivatives of Exponential and Logarithmic Functions

### IV. Applications of the Derivative

- Absolute Extrema
- Local Extrema
- First Derivative Test for Local Extrema
- Justification of Absolute Extrema
- The Second Derivative
- Definition of an Inflection Point
- Concavity and the Second Derivative
- Relationship Between the Graphs of  $f$ ,  $f'$ , and  $f''$
- The Second Derivative Test for Local Extrema
- Modeling and Maximum and Minimum Problems
- Using the Tangent Line to Approximate a Function The Differential
- Related Rates Problems
- The Mean Value Theorem for Derivatives

### V. The Definite Integral

- Reimann Sums Including Left, Right, Midpoint
- Estimation of Change in a Function Using Riemann Sums
- Definition and Interpretation of the Definite Integral
- Definite Integral and Antidifferentiation

**END OF TERM II**

**1/20**

- Average Value of a Function

Finding the Derivative of an Integral  
The Fundamental Theorem of Calculus  
Trapezoidal Rule

VI. Differential Equations

Definition of a Differential Equation  
Slope Fields Including Solutions of Initial Value Problems  
Antidifferentiation  
Antidifferentiation by Substitution  
Exponential Growth and Decay  
Solving Other Differential Equations (Variables Separable Only)

VII. Applications of Definite Integrals

Finding Total Change in a Function Given a Rate of Change, Including Distance Traveled  
Area Between Two Functions  
Volume of a Solid with Known Parallel Cross-Sectional Areas (Volume by Slicing)  
Volume of Solids of Revolution, the Disk Method  
Volume of Solids of Revolution, the Washer Method

**END OF TERM III**      **3/26**

Ideally, I would like to spend four weeks in **Term IV** reviewing for the exam. This is tentative, however, and allows us room should we need more time on a specific topic.

**Grading:**

20 % - **Homework** – Everyday we have homework I will check it the day after. I am not collecting or grading it, I will just go around and check to see if it's complete and attempted. Oh ya, **NO MAKEUPS** on the homework...it's due the day after I assign it and not a second later.

25 % - **Take Homes** – There will be a take home test assigned **every** Friday and will be due the upcoming Friday. These tests will consist of 4 AP type Free Response Questions. The grading will be 9 points a question for a total of 36 points and graded on the AP “square root” grading scale. For example if you get 22 out of 36 points, to get your grade you would take the square root of 17 divided by 36. So what is that grade?????? Once Again, the same makeup policy holds...**NO MAKEUPS**...they are due Friday and not a second later. If you are not in on Friday you it's due the next day you come back. If you are out the day I hand them out **IT IS YOUR RESPONSIBILITY** to get the take home when you come back to school.

25 % - **Daily Quizzes** – Believe it or not, you will have a quiz ALMOST every single day. These “everyday” quizzes will consist of 2 AP type multiple choice questions worth 6 points each. These quizzes will also be graded on the AP “square root” grading scale. So let's say you did one problem correctly and showed all work and got the answer correct and on the other problem you got the answer right but showed no work. You would score a 7 out of 12, and using the AP “square root” scoring method your grade would be \_\_\_\_\_. All of these problems will be graded using the Effective Problem Solver Rubric.

25 % - **Tests and Quizzes in class** – These will be announced or **random**. Hopefully once every week or two we will have a test or quiz in class. Most of the time they will be AP format. Tests will almost definitely be taken right off of the Take-Home Exams, so it makes it imperative that you not only do the take home but also understand it.

5% - **Classroom Participation and Behavior** – Every week you will get a grade from 0 to 100 based on your classroom participation and behavior in class. This grade will be determined by such things as coming to class on time, being respectful to others in class, and acting like a civil student while you are in this class. This grade will be determined by a mutual grading process from me and you using the Respectful Person Rubric.