

Dear AP Calculus Student,

Welcome to AP Calculus. This course is primarily concerned with developing your understanding of the concepts of calculus and providing experience with its methods and applications. The course emphasizes a multi-representational approach to calculus, with concepts, results, and problems being expressed graphically, numerically, analytically, and verbally. In order to be successful in this course you need the proper foundation (i.e., knowledge of algebra, geometry, trigonometry, analytic geometry, and elementary functions). You will have to be very familiar with the basic families of functions, and all of their representations, in order to be successful in your study of calculus. The concept of functions underlies everything that calculus considers.

You will also need to be able to carry out certain computational tasks (i.e., algebra skills) with efficiency and accuracy if you are going to be successful in calculus. These include manipulations of functional symbolism, solving algebraic equations involving the functions mentioned above, interpreting numerical values given by formulas, graphs, and tables, using and manipulating data, and knowing how, and when to use your calculator.

This is a rigorous college course. The curriculum and pace of the course is intense and all enrolled students are required to take the AP exam. If you are not willing or able to put in the time and effort needed to be successful in an AP class, please consider a schedule change now. Once the school year starts, you cannot drop the class until mid-October.

It is in your best interest to review the sample questions provided on the subsequent pages, and prepare yourself prior to the first day of school. The questions are divided over the weeks of the summer so you can pace yourself or you can do them all at once. You will earn a **test grade** if you turn in the problems, with work, on the first day of school. **On the second day of school, you will have a quiz on the trig values for the common angles of the unit circle. Be prepared.**

Feel free to contact me with any questions or concerns that you or your parents may have. Have a restful summer and be ready for an exciting time in AP Calculus next year.

Sincerely,

A handwritten signature in black ink, appearing to read 'K. Bookbinder', with a stylized flourish extending to the right.

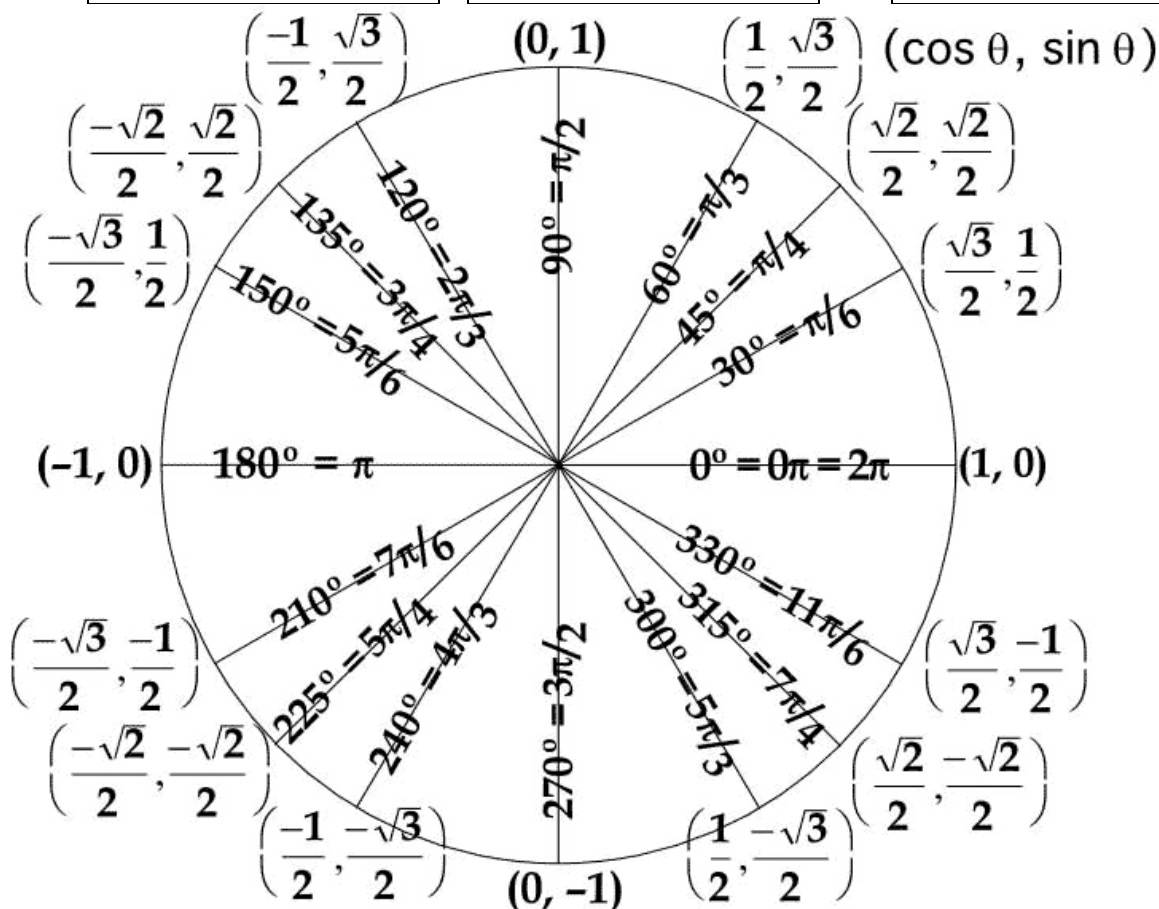
Ms. Bookbinder  
krbookbinder@henrico.k12.va.us

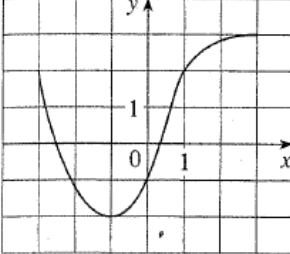
The following Trigonometric Identities **MUST** be memorized

Reciprocal Identities	Quotient Identities	Pythagorean Identities
$\sin x = \frac{1}{\csc x}$ $\csc x = \frac{1}{\sin x}$	$\tan x = \frac{\sin x}{\cos x}$	$\sin^2 x + \cos^2 x = 1$
$\cos x = \frac{1}{\sec x}$ $\sec x = \frac{1}{\cos x}$	$\cot x = \frac{\cos x}{\sin x}$	$\tan^2 x + 1 = \sec^2 x$
$\tan x = \frac{1}{\cot x}$ $\cot x = \frac{1}{\tan x}$		$1 + \cot^2 x = \csc^2 x$

The **Radian** Measures and Coordinates **MUST** be memorized

Remember:  $\sin \theta = \frac{y}{r} = y\text{-coordinate}$ ,  $\cos \theta = \frac{x}{r} = x\text{-coordinate}$ , and  $\tan \theta = \frac{y}{x} = \frac{y\text{-coordinate}}{x\text{-coordinate}}$



Week Range	Assignment
June 19 – 23	 <p>The graph of a function <math>f</math> is given at the left.</p> <p>(a) State the value of <math>f(-1)</math>.  (b) Estimate the value of <math>f(2)</math>.  (c) For what values of <math>x</math> is <math>f(x) = 2</math>?  (d) Estimate the values of <math>x</math> such that <math>f(x) = 0</math>.  (e) State the domain and range of <math>f</math>.</p>
June 26 – 30	Give the six trig values for $\frac{\pi}{4}$ ( $\sin\theta$ , $\cos\theta$ , $\tan\theta$ , $\csc\theta$ , $\sec\theta$ , $\cot\theta$ )
July 3 – July 7	Expand and simplify. (a) $3(x + 6) + 4(2x - 5)$ (b) $(x + 3)(4x - 5)$ (c) $(\sqrt{a} + \sqrt{b})(\sqrt{a} - \sqrt{b})$ (d) $(2x + 3)^2$ (e) $(x + 2)^3$
July 10 – July 14	Give the six trig values for $\frac{5\pi}{6}$ ( $\sin\theta$ , $\cos\theta$ , $\tan\theta$ , $\csc\theta$ , $\sec\theta$ , $\cot\theta$ )
July 17 – July 21	Let $f(x) = \begin{cases} 1 - x^2 & \text{if } x \leq 0 \\ 2x + 1 & \text{if } x > 0 \end{cases}$ (a) Evaluate $f(-2)$ and $f(1)$ .      (b) Sketch the graph of $f$ .
July 24 – July 28	Give the six trig values for $\frac{3\pi}{2}$ ( $\sin\theta$ , $\cos\theta$ , $\tan\theta$ , $\csc\theta$ , $\sec\theta$ , $\cot\theta$ )
July 31 – Aug. 4	Find an equation for the line that passes through the point $(2, -5)$ and (a) has slope $-3$ (b) is parallel to the $x$ -axis (c) is parallel to the $y$ -axis (d) is parallel to the line $2x - 4y = 3$
Aug. 7 – Aug. 11	Give the six trig values for $3\pi$ ( $\sin\theta$ , $\cos\theta$ , $\tan\theta$ , $\csc\theta$ , $\sec\theta$ , $\cot\theta$ )
Aug. 10 – Aug. 18	Factor each expression. (a) $4x^2 - 25$ (b) $2x^2 + 5x - 12$ (c) $x^3 - 3x^2 - 4x + 12$ (d) $x^4 + 27x$ (f) $x^3y - 4xy$
Aug. 17 – Aug. 23	Give the six trig values for $\frac{-2\pi}{3}$ ( $\sin\theta$ , $\cos\theta$ , $\tan\theta$ , $\csc\theta$ , $\sec\theta$ , $\cot\theta$ )
Aug. 26 – Aug. 30	Given $f(x) = 3x^2 - 4x - 1$ , $g(x) = -5x^2 + 7$ , and $h(x) = 2x^3 + 8x^2 - 5$ Find:    a. $f(x) - g(x)$ b. $2h(x) - 3g(x)$ c. $\frac{1}{2}h(x) + f(x)$ d. $g(f(x))$ e. $f(x) \cdot g(x)$