Hello AP Calculus BC Students and Parents!

I am so grateful for the opportunity to be working with you during the upcoming school year! My name is Christopher Simpson. You may call me Christopher (not Chris, please), Mr. Simpson, Coach, or just plain Simpson – I'm fairly laid back about that. I only ask that you follow school rules and standards for addressing teachers at LBHS.

A little about me: I am originally from north-central West Virginia, and moved to SC in 2000 after graduating college with a B.A.Ed. in Music Education with minors in English and Mathematics. I began teaching AP Calculus AB (along with several other mathematics courses) in 2000 in a small Dillon County high school for three years. After five years and two schools in Horry County, I moved to Columbia in 2008 where I have been for the last 16 years. I was the AP Calculus instructor there from 2012 until 2024. During my 16 years there, I also taught AP Statistics, AP Music Theory, and a hybrid AB/BC course several times, as well as other various mathematics courses. This will be my first BC-only course, and I couldn't be more excited to be working with each of you!!

Please feel free to reach out to me with questions or concerns anytime! Until CCSD has assigned my district email address, you can reach me at Mssr.Simpson@gmail.com (a dedicated email address for current and former students). UPDATE: My CCSD email is live: christopher_simpson@charleston.k12.sc.us. You may use either email should you need to reach me. My goal is for you to be successful and to help you make positive choices that support your goals. I cannot make you successful, but with effort, determination, and hard work, you each will be. I set the bar high, but no higher than any of my students can reach: As long as you do your part, you will achieve.

During the summer, you should:
- review rational functions to help with the understanding of limits
- review/relearn the complete Unit Circle in radians (you should also know degrees)
- review writing equations of lines given two points (secant) *and* given a point and a slope (tangent) – recall: perpendicular (normal) lines share a point and opposite-reciprocal slopes (product = -1)
- Complete Get ready for AP Calculus: https://www.khanacademy.org/join/R4VNMBHY

I will add review materials related to the first three bullet points above to this document later in the summer. Much of that material is also in the KA Get ready course. I have included instructions/suggestions on the following page.

This is *your* class and *your* learning. I am here to help you achieve *your* goals. We are all more successful when we all focus our choices on our group and individual goals. We do this as a team. Go Team!

Again, I am so excited to be a Beckham Bengal, and I can't wait to see how far you each will go!

Thanks for all you do,
Christopher Simpson
Department of Mathematics
Lucy G. Beckham High School

Get ready for AP Calculus - Khan Academy

Some notes/suggestions about the Khan Academy review:

1. A little each day is better than a lot all at once. You can easily complete the entire review in about 15 minutes a day. Procrastinating or waiting until the end of summer will create unnecessary stress for everyone.
2. Going on vacation? No problem! The review quizzes are short (4 – 6 questions). You can complete a few while sitting in the car or on the plane.
3. Not happy with a score? Take it again! You are welcome and encouraged to aim for Mastery on every topic in every unit. That said…
4. Not performing up to your usual standards? Instead of spinning your wheels retaking the same checks over and over, email me! I can help! Or, you can watch a video (KA is really good about suggesting what you should do next). Or you can email me! That said…
5. Don't like the videos on KA? No worries! I get it. Find another set of videos on the topic that speaks to you! Several of my students last year couldn't stand Sal Khan's voice, and they tended to like TheOrganicChemistryTutor's videos on YouTube. Find any videos you like! I have ZERO preference.
6. Just can't finish before school starts? No worries; you'll have a little time the first week of school to wrap up your summer work while we do other reviewing. Also, the last four units will have a later Mastery deadline, but you need to have completed them, at least initially, by the end of the first week of school.

More suggestions:

-   Try beginning with the Course Challenge. This will test you out of and give you mastery points for anything you already know well. You may even want to take the course challenge twice before you begin!
-   Begin each unit by taking the test first as this will give you a similar time advantage as starting with the course challenge.
-   Then, start by trying the quiz.
-   Only watch a video if you need help with a skill. Your goal is Mastery of the skills – do not waste your summer learning something you've already mastered!

If you follow this global-to-local (outside-in) path, you may find that you have very little left to review.

Please let me know if you have questions! Do *not* spin your wheels by taking the same review assessments over and over and over.
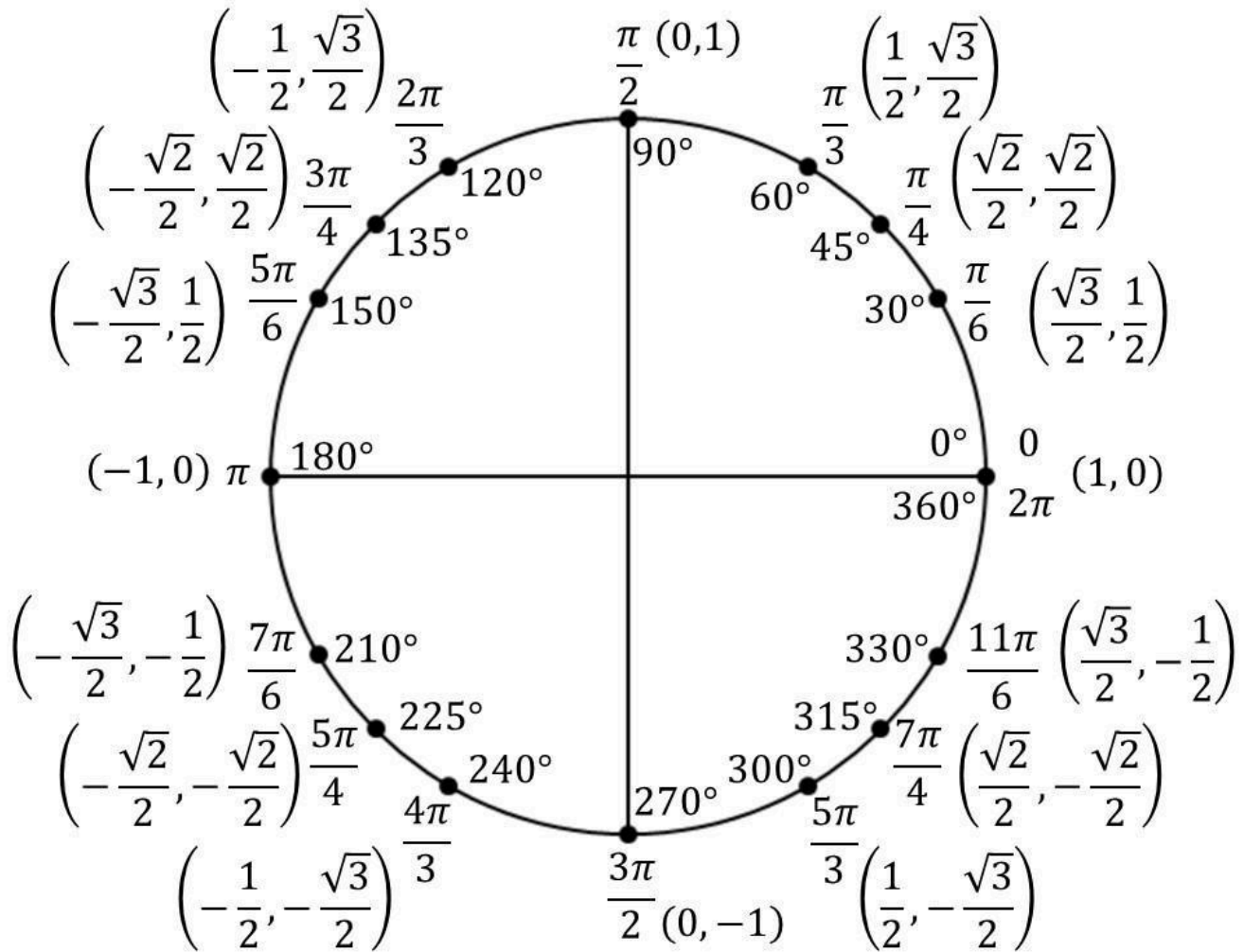
Best,
cs

Rational Functions Review

Coming soon

The Unit Circle Review

At a *minimum*, you should know this:

$$\left(-\frac{1}{2}, \frac{\sqrt{3}}{2}\right) \quad \frac{2\pi}{3} \quad 120° \qquad \frac{\pi}{2} \ (0,1) \quad 90° \qquad \frac{\pi}{3} \quad 60° \quad \left(\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$$

$$\left(-\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}\right) \quad \frac{3\pi}{4} \quad 135°$$

$$\left(-\frac{\sqrt{3}}{2}, \frac{1}{2}\right) \quad \frac{5\pi}{6} \quad 150° \qquad 45° \quad \frac{\pi}{4} \quad \left(\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}\right)$$

$$30° \quad \frac{\pi}{6} \quad \left(\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$$

$$(-1,0) \ \pi \quad 180° \qquad 0° \quad 0 \quad (1,0)$$

$$360° \quad 2\pi$$

$$\left(-\frac{\sqrt{3}}{2}, -\frac{1}{2}\right) \quad \frac{7\pi}{6} \quad 210° \qquad 330° \quad \frac{11\pi}{6} \quad \left(\frac{\sqrt{3}}{2}, -\frac{1}{2}\right)$$

$$\left(-\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2}\right) \quad \frac{5\pi}{4} \quad 225° \quad 240° \qquad 315° \quad 300° \quad \frac{7\pi}{4} \quad \left(\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2}\right)$$

$$270° \qquad \frac{5\pi}{3}$$

$$\left(-\frac{1}{2}, -\frac{\sqrt{3}}{2}\right) \quad \frac{4\pi}{3} \qquad \frac{3\pi}{2} \ (0,-1) \qquad \left(\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$$

Additionally, you should be able to correctly
- label each quadrant using the appropriate Roman numeral,
- indicate the signs of each quadrant using ordered pair notation, and
- memorize the mnemonic device ASTC (if you know this already, GREAT!! and if not, we will do this on day one).

Finally, you must must must know that each ordered pair (x, y) on the unit circle corresponds to the values of $(\cos \theta, \sin \theta)$.

This will be quizzed daily beginning on day 1 (practice quiz) until all students score 100% on two consecutive days.

If you approach this as, "I must learn this," as opposed to, "I need to have this memorized," you will be way ahead in the calculus game.

A note about angles measured in degrees: Although we do not use degrees in any calculations in calculus, you may encounter them. Please reacquaint yourself with the formula to convert degrees to radians, as it is possible to run into a question that measures angles in degrees.

Please do not hesitate to email me with any clarification questions.

Best,
cs

Equations of Lines Review

OLD	NEW
Slope-Intercept Form	
$y = mx + b$	$y = f(0) + mx$
$y = b + mx$	$y = y_0 + mx$
Point-Slope Form	
$y - y_1 = m(x - x_1)$	$y = y_0 + m(x - x_0)$
	$y = f(a) + f'(a)(x - a)$

* The point (x_0, y_0), pronounced x-naught, y-naught (naught meaning 0), is called the initial condition. When $y_0 = f(0)$, the initial condition is the y-intercept.

**The second form of the point-slope line above is the equation of the tangent line to the graph of $f(x)$ at the point $(a, f(a))$ and the equation of the normal line is $y = f(a) - \frac{1}{f'(a)}(x - a)$. There can be only one tangent line at any particular point (in such a case where there are more, the derivative is said to be undefined since a line can have only one slope), and one normal line at that point since any line can have only one line perpendicular to it at said point.

You do *not* need to understand everything above until week one when we discuss it in class, but you should be aware of any vocabulary differences in your toolbox, as this is the language we will speak when discussing lines.

Skills to Review
You should be able to rewrite the equation of a line given to you in any form into any of the three forms. Although we rarely explicitly use the Standard or General form of a line in calculus, you definitely may encounter it.

You should be able to find the slope of a line given an equation in any form. You should also be able to find the slope of a line given any two points or one point and some relationship to another line. For example: Write the equation of the line passing through the point (a, b) that is parallel (or perpendicular) to [equation of line in whatever form is given]. For slope, we will use $\frac{\Delta y}{\Delta x}$.

These linear skills will be quizzed during week one. There should be nothing you did not learn in Algebra 1 or 2 and reinforced in Precalculus you will see with regards to lines. Please feel free to reach out with any clarification questions.

Best,
cs