AP Calculus AB Summer Assignment – Summer 2022
Mr. Donaghy

Welcome to my calculus class. I'm sure that you will enjoy calculus as much as I do. The summer assignment has 2 purposes: to keep pre-calculus concepts fresh (chapter P) and to start the first calculus lessons before September (chapter 2). **The assignment is long – do not wait until the end of August to start it.**

Calculus is not just the next math class in the Algebra 1, Algebra 2, Precalculus line. Rather, it is the first math class in the next level of mathematics. Calculus is essential to the study of physics, physical chemistry, thermodynamics, quantum mechanics, and all engineering disciplines. AP Calculus AB is equivalent to the first semester of college calculus. For those of you who are interested in the math and science disciplines, there is a lot more calculus to learn after AB – but it will be fun!

What makes calculus different? Simply put, it is the "limit process" applied to problems that we have already studied. The limit process is applied to the concepts of slope and area in ways that allow us to solve problems that we could not easily solve before. This is described in chapter 1.

Here are the details for the assignment.

Textbook: I recommend that you buy the e-book. The hardcopy book is available but is very expensive.

Calculus for AP, 2ⁿᵈ Edition, by Ron Larson and Paul Battaglia, 2020. ISBN: 978-0-357-43194-8

To receive your Cengage Learning materials for this course, please call 888-915-3276 with a credit card ready and reference this "Master Case" number: 06694911. You will be provided with the digital access. The digital package (Webassign, including the e-book is ISBN: 9780357520437)
The price is $50 for one year access.

Cengage Webassign will ask you for a class code. Enter the following: **wardlawhartridge.nj 3789 6420**

I will collect the problems on the first day of class. No late assignments will be accepted. The only exception for a late assignment is if you are not in school due to illness. (in other words, don't do the assignment the day that it is due!) The assignment will count as a 100 pt test grade. Grades will be based on effort.

Please have the assignment ready to hand in: Separate paper (not in a notebook), your name, stapled.

<u>**Assignment:**</u>

Read chapter P: Preparation for Calculus (precalculus review)
Do problems: chapter P review exercises pages 54-55 (all odd problems)

Read chapter 1: Limits and Their Properties
   *** Please note that chapter 1 has new topics. I expect that you will have a good understanding of them in September. I will not spend much time on this chapter and there will be a chapter test.
Do Problems:
        1.1 (pages 63-64) 1-23 (odd)
        1.2 (pages 72-75) 1-29 (odd), 64-70,77-80
        1.3 (pages 84-86) 1-85(every other odd – i.e. 1,5,9,13,…) 123-125
        1.4 (pages 96-99) 1-67 (every other odd), 127-130
        1.5 (pages 105-107) 1-65(every other odd), 87-89
   1.6 (pages 115-117) 1-5, 7-41(every other odd) 83-86

Do the trigonometry review problems on the following page.

Feel free to email me with any questions: mdonaghy@whschool.org and I will see you in September

Mr. Donaghy

Directions: Solve each problem on separate sheet of paper. Please show all of your work. Do not use a calculator except where indicated. Hint: A calculator will not help you to solve most of the problems.

1. Find the exact value of each of the other trigonometric functions of the angle θ (without finding θ) given that $\sin\theta = -\dfrac{2}{3}$ and $\cot\theta > 0$.

2. For the following problems, find the exact values of each of the trigonometric functions:

   a. $\sin\left(\dfrac{5\pi}{4}\right)$ c. $\cos\left(\dfrac{7\pi}{4}\right)$ e. $\tan\left(\dfrac{5\pi}{3}\right)$

   b. $\cot\left(\dfrac{11\pi}{6}\right)$ d. $\sec\left(-\dfrac{3\pi}{2}\right)$ f. $\csc(-2\pi)$

3. Find all angles θ for which $\cos\theta = -\dfrac{\sqrt{3}}{2}$ and $0 < \theta < 2\pi$.

4. Solve each equation by using facts about the values of the trigonometric functions. In each case write the complete solution set. Use the graph of the function as an aid.

   a. $\cos x = \dfrac{\sqrt{3}}{2}$ b. $\tan x = \dfrac{1}{\sqrt{3}}$

5. Without a calculator, graph one period of the function $f(x) = 4\cos\left(t + \dfrac{\pi}{4}\right)$.

6. Find formulas for the trigonometric functions represented in the following graphs:

   a.   b.
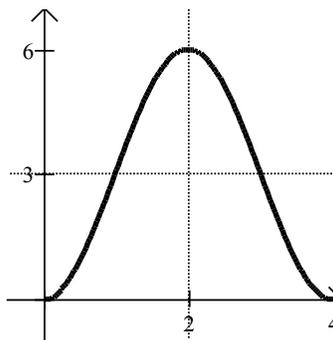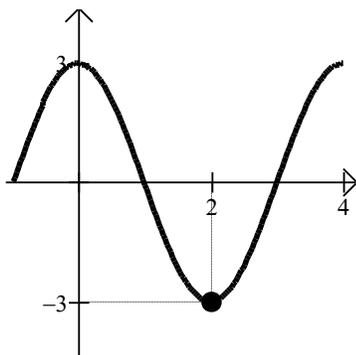
7. Solve the following equations. If a solution exists, **give the general solution**. If a solution does not exist, give a reason. Check your answers graphically with a calculator.

   a. $\sin x = \dfrac{\sqrt{2}}{2}$ b. $\cos(3\theta) = \dfrac{1}{2}$ c. $\sin\left(\dfrac{\theta}{8}\right) = -\dfrac{\sqrt{3}}{2}$

8. Given that $\sin x = \dfrac{7}{25}$, $\pi/2 < x < \pi$, find the exact values of $\sin 2x$, $\cos 2x$ and $\tan 2x$. Check your answer with a calculator.

9. Solve the following equations, checking your answers algebraically and graphically (with a calculator).

   a. $5\cos x - \cos x \sin x = 0$ b. $2\sin^2 x - \sin x - 1 = 0$