AP CALCULUS

Summer Assignment

Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

“Contrary to common belief, the calculus is not the height of the so-called, higher mathematics. It is, in fact, only the beginning.” -Morris Kline

***ATTENTION: THIS ASSIGNMENT IS OPTIONAL !!!!! AP Calculus Summer Assignment***

**Due Date: The beginning of class on the first Day of the school year.**

The purpose of this assignment is to have you practice the mathematical skills necessary to be successful in AP Calculus. All of the skills covered in this packet are skills from Algebra 2 and Pre-Calculus. If you need to, you may use reference materials to assist you and refresh your memory (old notes, textbooks, online resources, etc.). While the graphing calculators will be used in class, there are ***no calculators allowed* on this packet. You should be able to do everything without a calculator. You MUST show all work to receive CREDIT!**

AP Calculus is a fast paced course that is taught at the college level. There is a lot of material in the curriculum that must be covered before the AP exam in May. Therefore, we cannot spend a lot of class time re-teaching prerequisite skills. This is why you have this packet. Spend some time with it and make sure you are clear on everything covered in the packet so that you will be successful in Calculus. You can also use the packet throughout the year as a review tool for those concepts as they arise. Of course, you are always encouraged to seek help from your teacher if necessary.

This assignment will be collected and graded the first Monday of the school year. Be sure to show all appropriate work to support your answers. In addition, there will be several quizzes on this material during the first quarter.

***Good Luck and we look forward to a great year next year!***

If you choose to complete 100% of this assignment, you will receive a quiz grade before anyone else!!!!

Go for it☺!

Dear Future AP Student,

I hope you are excited for the year of Calculus that we will be pursuing together! I don’t know how much you know about Calculus, but it is not like any other branch of math that you have learned so far in your math careers. We will be having a lot of fun – and doing a lot of work – learning about derivatives (for the first semester) and integrals (for the second semester). You don’t need to know what those things are (yet) but I will tell you that Calculus is described as the “mathematics of change” – how fast things change, how to predict change, and how to use information about change to understand the systems themselves.

Actually, in some ways, Calculus is taking what you already know a step further. You know how to find the slope of a line, right? You probably don’t know how to find the slope of a curve because it’s constantly *changing* – but Calculus helps us do that. So ‘traditional’ math tells us how to find the slope of a line, and Calculus tells us how to find the slope of a curve. ‘Traditional’ math tells us how to find the length of a rope pulled taut, but Calculus tells us how to find the length of a curved rope. ‘Traditional’ math tells us how to find the area of a flat, rectangular roof, but Calculus tells us how to find the area of a curved dome-shaped roof. Get the idea?

**See you soon!!!!**

**Part I.)** Study and recall; you will have a quiz within the first 5 days of school

UNIT CIRCLE HANDOUT



**Part II.) Complete the following Family of functions table:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Function | Graph | Domain | Range  (Bounded ?) | Asymptotes | Even,Odd, Neither |
| Identity Function  f(x) = x |  |  |  |  |  |
| Square Function  f(x) = x2 |  |  |  |  |  |
| Cube Function  f(x) = x3 |  |  |  |  |  |
| Reciprocal Function  f(x) = 1/x |  |  |  |  |  |
| Square Root Function  f(x) = √x |  |  |  |  |  |
| Exponential Function  f(x) = ex |  |  |  |  |  |
| Natural Logarithm Function  f(x) = ln x |  |  |  |  |  |
| Sine Function  f(x) = sin x |  |  |  |  |  |
| Cosine Function  f(x) = cos x |  |  |  |  |  |
| Absolute Value Function  f(x) = |x| |  |  |  |  |  |
| Greatest Integer  Function  f(x) = [x] |  |  |  |  |  |
| Logistic Function  f(x) = |  |  |  |  |  |

Part III.) **Algebra Review**

*Show all work – No credit will be given for answers missing appropriate work. No calculators.*

Simplify the rational expression. State any restrictions on the variables domain.



Multiply or divide. State any restrictions on the variables domain.



Add or subtract. Simplify, if possible.



Simplify the complex fraction.



***Solve each equation or inequality for x over the set of real numbers.***

***11.  12. ***

***13. 14.***

***15. 16.***

***Solve each of the systems.***

***17.  18.***

***Write the following equations described.***

***19. Write the equations of a line that is parallel to y=2x+3 and passes through the point (6,2).***

***20. Write the equation of a line that is perpendicular to y=-3/2x -3 and passes through the point (6,7).***

***21. Write the equation of the perpendicular bisector that goes through the line segment with endpoints at (-1,1) and (7,5).***

***Simplify the following radicals.***

***22. 23. 24.***

***25.  26. 27.***

**PART IV: Precalculus Review**

***Use your knowledge of the unit circle to evaluate each of the following. Leave your answers in radical form.***

Given the function below, find the amplitude, period, and phase shift (if any):

Amplitude Period Phase shift (if any)

1.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_
2.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_
3.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_
4.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_

***Use your knowledge of the unit circle to evaluate each of the following. Leave all answers in simplest radical form.***

***5.  6.  7.***

**8.  9.  10. **

**11. 12.  13.**

**14. 15. 16.**

***Solve each trigonometric equation for .***

**17. 18.**

**19. 20.**

**Solve each exponential or logarithmic equation.**

**21.  22.  23.**

**24. 25.  26.**

**27.**

**Expand each of the following.**

**28. 29. **

**Complete each of the following using trig identities and formulas.**

**30.  31. **

**32. 33.**

**34. 35.**