AP CALCULUS AB

SUMMER ASSIGNMENT

Welcome to AP Calculus AB! If you have any trouble completing these problems, we will have an intensive review during the first week of school. These problems should give you a good idea of what you need to know when beginning a calculus course. **Please do not use a calculator for problems 1-9**. Enjoy!

1. Please simplify the following expression. Leave your answer in factored form. Hint: Factor out the greatest common factor in the numerator.



1. For the following function, please determine on which intervals the function is decreasing and which intervals the function is increasing. (A function is increasing if the “y” values increase as “x” increases. The function is decreasing if the “y” values decrease as “x” increases.)



1. Please graph the function. Find the horizontal and vertical asymptotes and all intercepts.



1. In problem 3, what does the value of  approach as  approaches a very large value (infinity)? Please justify your answer.
2. You wish to solve the equation  . Please explain why you cannot find all solutions to the equation by dividing both sides by .
3. Please **explain** two ways you can you solve the problem  **by graphing one or two functions (you do not actually have to solve the equation)**. Now, please find the exact solution to the equation without a calculator.
4. The line with slope 7 containing the point (2 , 2 ) is tangent to the graph of the function  .

a. Please graph the function and the line tangent to the function.

b. Please find the equation of the line tangent to the function at the point ( 2 , 2 ).

c. Use the line tangent to the function to estimate the value of .

d. Is the estimate less than or greater than ? Please justify your answer.

1. Please evaluate. 
2. Please find the **general** solutions to the equation  .
3. You may use a calculator for this problem.

a. Given the function  , find several values for  as  approaches zero.

b. If you set  equal to zero, what do you obtain for  ? What does this result tell you about the graph of  at  ?

c. What happens to the function as  approaches infinity?

