AP Calculus BC Summer Work

This is not like last year's summer assignment, or any other math assignments that you have previously completed. While non-traditional in nature, this will let you expand on your knowledge as you assume the role of the teacher. Do not be daunted by the task unless you decide to wait until the end of the summer to do this work.

Each of you will be graded according to the rubric attached at the end. However, your work cannot duplicate anyone else's, including the textbook, or any other textbooks. As always, feel free to email me with any questions at mhain@stpaulsmd.org. Please know it may take 48 hours to receive a response in the summer and I will be unable to answer email from August 1 – August 10.

Good luck!
Mrs. Hain

Part 1: Formulate 10 limit problems where using many different methods would have to be implemented to evaluate the limits. The following techniques must be employed on separate problems.

- Rationalizing
- Simplifying
- L'Hospitals
- Direct Substitution
- Graphing
- Table
- Piecewise function where you show the graph
- Involve at least one of the following functions: trigonometric, exponential, polynomials, rational, logarithmic, and piecewise

You must also attach the worked-out solutions for each of the limits on a separate sheet of paper.

Part 2: Formulate 10 derivative problems. You must include derivatives where you use the following:

- Power rule
- Product rule
- Quotient rule
- Chain rule
- Log rule
- Exponential rule
- Trigonometric derivative rules
- Two of the problems must ask for the equation of a tangent line at a point.

Again, you need to attach the worked-out solutions for each of the derivatives on a separate sheet of paper.

Part 3: Formulate 10 integration problems—5 definite and 5 indefinite.

- At least one of each type must involve trigonometry and trigonometric values
- Each of the following must be involved in at least one problem:
    - Trigonometry
    - Natural logarithms
    - Exponential functions
    - U-substitution
    - Volume of revolution

Again, you need to attach the worked-out solutions for each of the integrals on a separate sheet of paper.

Guidelines	Points	Comments
Limit Problems • 10 problems created • Problems use required properties • Solutions sheet included and correct	_____/5	
Derivative Problems • 10 problems created • Problems use required properties • Solutions sheet included and correct	_____/5	
Integral Problems • 10 problems created • Problems use required properties • Solutions sheet included and correct	_____/5	
Overall completeness • Assignment is completed on time • Assignment is neat and organized • Questions written for an audience of peers	_____/5	
TOTAL	_____/20	