AP Calculus **ENTRANCE TEST** **Kakaley - 209**

This will be graded as a 100 point test. Point value is indicated at the beginning of each section. Complete the following to the best of your ability. Some questions **may** require independent learning or the use of a graphing calculator. **SHOW ALL WORK**.

(4 points each) Find dy/dx , y′ , or f′(x) [Basic Rules – Power, Product, and Quotient Rules]

1. $y = \frac{1}{3}x^3$

2. $f(x) = \frac{1}{\sqrt{x}}$

3. $f(x) = (x+1)(x^2 - 2)$

4. $y = \frac{x^2}{8-3x}$

(6 points each) Find f ′(x) [Trig Rules]

5. $f(x) = \cos x - 2\tan x$

6. $y = 2\sin x + 3\cos x$

(8 points each) Compute dy/dx [Chain Rule]

7. $y = \sin(3x^2)$

8. $f(x) = \left(\frac{x-6}{x+7}\right)^2$

9. $y = (6x - 5)^3$

10. $y = \frac{1}{\sqrt{2x-1}}$

(10 points each) Use a **TI-89** graphing calculator to evaluate the following

11. Find an appropriate viewing window for $f(x) = x^3 - 2x^2 - 15$

12. Find all solutions for $x^4 - 2x^2 + 1 = 1 - x^2$

13. Find where $g(x) = x^3 - x$ intersects the x-axis

14 . If $y = x^2 \sin(x^3)$, find the derivative dy/dx, and then find the derivative when x = 2 using the following commands (the differentiate command can be found by using [F3] [1:] or [2^{nd}] [8] on the home screen)

***d*(x∧2*sin(x∧3), x)**

***d*(x∧2*sin(x∧3), x)|x = 2**