Name:
ID #:   **Serial #:**

1. **Evaluate the following limits:**

(a) $\lim\limits_{h \to 0} \dfrac{\arccos\left(\dfrac{1}{2}+h\right)-\arccos\left(\dfrac{1}{2}\right)}{h}$

(b) $\lim\limits_{x \to 0} \dfrac{\sin(x)\tan(3x)}{x^3 + 2x^2}$

2. Find the derivative of:

(a) $\dfrac{y}{x^3} + \dfrac{x}{y^3} = x^2 y^4$

(b) $y = \ln\left(\sqrt{\tan(\sin^{-1}(e^{5-4e}))}\sqrt{\ln(\arccos(\dfrac{1}{4\pi^2}))}\,\right)$

3. If the line $3x + y = b$ **is tangent to the parabola** $y = ax^2$ **when x = -2, Then find 4a+b.**

4. Find all points (x, y) **on the graph of** $f(x) = \dfrac{x-1}{2-x}$ **where tangent lines are perpendicular to the line** $8x + 2y = 1.$

Good luck

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