NallPro® Education Centre
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G12 – Calculus Exam – 01 www.NallPro.com **Name:**

Show all your details work on separate sheet(s) (8½ x 11):

1. Find $f'(x)$ IF $f(x) = 2x^2 - 3x$ FROM FIRST PRINCIPLES

2. EVALUATE THE FOLLOWING LIMITS

a) $\lim_{x\to 0} (3x^2 - 1)(5x + 1)$

b) $\lim_{x\to 2} \frac{4 - x^2}{2 - x}$

c) $\lim_{x\to \infty} \frac{3 - x - 7x^2}{1 - 2x^2}$

d) $\lim_{x\to 3^-} \frac{2x - 6}{|x - 3|}$

e) $\lim_{x\to 3} \frac{(3x-1)^{\frac{1}{3}} - 2}{x - 3}$

3. FIND $\frac{dy}{dx}$ AND LEAVE YOUR ANSWERS UNSIMPLIFIED

a) $y = \frac{3x}{(2x^2 - 3)^3}$

b) $y = 2x^{\frac{2}{5}} - \frac{1}{\sqrt{\pi}} - \pi x$

c) $y = 2x^3 e^{-4x^2 + 5x}$

d) $y = \frac{\sin x}{\cos x}$

e) $y = \ln\left(\frac{x^2 - 1}{\sqrt{x}}\right)$

f) $y = \log_5(3x + 2)^4$

4 a) Find a simplified expression for $\frac{dy}{dx}$ given the relation $(x + y)^3 - x^2y = 8$

4b) FIND EQUATION OF THE TANGENT LINE AT THE POINT (0,2)