PRINCE SULTAN UNIVERSITY

MATH 111 CALCULUS

MAJOR EXAM 3 14th JANUARY 2009

Time allowed: 50 minutes

Name: _____

I.D. _____

Instructors Name: _____ **Section:** _____

1. Answer all questions
2. This exam consists of 1 Cover Sheet & 2 Question Sheets with 4 questions.
3. You can use a calculator, **NOT** a mobile phone.
4. No talking during the test.
5. Show all working out in the space provided.

Question No.	Max. Points	Points Scored
1	15	
2	5	
3	5	
4	5	
TOTAL SCORE	30	

1) [15 points] Find $\frac{dy}{dx}$

(a) $y = \left(x^2 + 2x - 1\right)^5 + \sqrt[3]{\tan x}$

(b) $y = \frac{e^{3x}}{\ln x}$

(c) $y = x^2 \log_2(3 - 2x)$

(d) $y = \sin^2(e^x) + 3^{-x}$

(e) $y = x \sin^{-1} x + \sqrt{1 - x^2}$

2) [5 points] Find the equation of the tangent line to the curve $xy + y^2 = 2$ at the point (1, 1).

3) [5 points] Given that $y = \dfrac{x\cos^3(x)\tan^{-1}x}{\sqrt{2x+1}}$. Use logarithmic differentiation to find y'.

4) [5 points] A 10-ft ladder is leaning against a vertical wall. If the bottom of the ladder is pulled along the ground away from the wall at a constant rate of 2 ft/s, how fast will the top of the ladder be moving down the wall when the top is 6 ft above the ground?.