

Serial No.: \_\_\_\_\_ Student Name: \_\_\_\_\_ Student Number: \_\_\_\_\_  
Instructor: M. Z. Abu-Sbeih Math 101- Q4A Date: 28-4-2008

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**Problem 1:** (4 points) Evaluate the limit if it exists:

$$\lim_{x \rightarrow \frac{\pi}{4}} \frac{\sin x - \cos x}{\cos 2x}$$

**Problem 2:** (4 points) If  $x^3 + y^3 = 2$  find  $y'$  and  $y''$  at (1,1)

**Problem 3:** (17 points) Find  $y'$

1.  $y = \tan^{-1} x + \csc^{-1} x$

2.  $y = \log_5(\sec x + \cot x)$

3.  $y = \sqrt[3]{\frac{\cos x}{x^4 + 1}}$

4.  $y = (1+x)^{\ln x}$

5.  $y^x = x^y$  at (1,1)

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Instructor: M. Z. Abu-Sbeih Math 101- Q4B Date: 28-4-2008

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**Problem 1:** (4 points) Evaluate the limit if it exists:

$$\lim_{x \rightarrow 0} \frac{\sin x}{x + \tan x}$$

**Problem 2:** (4 points) If  $x^4 + y^4 = 2$  find  $y'$  and  $y''$  at (1,1)

**Problem 3:** (17 points) Find  $y'$

1.  $y = \cot^{-1} x + \sec^{-1} x$

2.  $y = \log_7(\csc x + \tan x)$

3.  $y = \sqrt[5]{\frac{\sin x}{x^3 + 1}}$

4.  $y = (2 - x)^{\ln x}$

5.  $y^x = x^y$  at (1,1)