Math 1A (7:30am – 8:20am)
Quiz 5 Version C
Fri Oct 29, 2010

NAME YOU ASKED TO BE CALLED: _____

SCORE: ___ / 30 POINTS

NO CALCULATORS ALLOWED
SHOW PROPER WORK / USE PROPER NOTATION / SIMPLIFY YOUR ANSWERS

If $f(x) = (1-x^2)^{-2}(5-2x)^3$, find $f'(x)$. Your final answer should be in factored simplified form. **SCORE: ___ / 5 POINTS**

SEE VERSION A KEY

Find the slope of the tangent line to $(x^2+y^3)^2 = 1-2x^2y^3$ at $(2,-1)$. **SCORE: ___ / 5 POINTS**

SEE VERSION A KEY

If $f(x) = (2+3x)^{\tan x}$, find $f'(x)$. **SCORE: ___ / 5 POINTS**

$$\ln f(x) = \tan x \ln(2+3x)$$

$$\frac{f'(x)}{f(x)} = \sec^2 x \ln(2+3x) + \tan x \cdot \frac{3}{2+3x}$$

$$f'(x) = f(x)\left(\sec^2 x \ln(2+3x) + \frac{3\tan x}{2+3x}\right)$$

$$= (2+3x)^{\tan x}\left(\sec^2 x \ln(2+3x) + \frac{3\tan x}{2+3x}\right)$$

$$= (2+3x)^{\tan x - 1}\left((2+3x)\sec^2 x \ln(2+3x) + 3\tan x\right)$$

➡

Prove that $\frac{d}{dx}\tan^{-1} x = \frac{1}{1+x^2}$.

SCORE: ___ / 4 POINTS

SEE VERSION A KEY

Find $\frac{d}{dx}\sin^{-1}\sqrt{x}$.

SCORE: ___ / 4 POINTS

SEE VERSION A KEY

The amount you pay for car insurance every year depends on how many miles you drive each day. If $p = f(d)$, where p is your yearly payment (in dollars), and v is your daily driving (in miles), what does the statement $f'(20) = 3$ mean ? Give the units of measurement for each number in your answer.

SCORE: ___ / 3 POINTS

NOTE: Your answer should NOT include "derivative", "instantaneous", "rate of change", "with respect to", "slope" or "tangent line".

SEE VERSION A KEY

The table below shows values of $f(x)$, $f'(x)$, $g(x)$ and $g'(x)$ for several values of x. If $h(x) = g(f(x))$, find $h'(2)$.

SCORE: ___ / 4 POINTS

x	–3	–2	–1	0	1	2	3
$f(x)$	2	–1	–3	–2	3	1	0
$f'(x)$	–1	3	4	–2	–3	–1	2
$g(x)$	–1	3	1	–2	0	–3	2
$g'(x)$	4	–3	–2	3	–1	2	1

$h'(x) = g'(f(x)) \cdot f'(x)$

$h'(2) = g'(f(2)) \cdot f'(2)$

$= g'(1) \cdot (-1)$

$= (-1)(-1)$

$= 1$