MATH 220 **Test 2** **Spring 2013**

Name _____ **NetID** _____

- Sit in your assigned seat (circled below).
- Circle your TA discussion section.
- Do not open this test booklet until I say *START*.
- Turn off all electronic devices and put away all items except a pen/pencil and an eraser.
- Remove hats and sunglasses.
- You must show sufficient work to justify each answer.
- While the test is in progress, we will not answer questions concerning the test material.
- Do not leave early unless you are at the end of a row.
- Quit working and close this test booklet when I say *STOP*.
- Quickly turn in your test to me or a TA and show your Student ID.

▷ **AD1**, TR 9:00-10:50, Nick Andersen
▷ **AD2**, TR 1:00-2:50, Sarah Loeb
▷ **ADA**, TR 8:00-8:50, Lisa Hickok
▷ **ADB**, TR 9:00-9:50, Sneha Chaubey
▷ **ADC**, TR 10:00-10:50, Sneha Chaubey
▷ **ADD**, TR 11:00-11:50, Tom Mahoney
▷ **ADE**, TR 12:00-12:50, Tom Mahoney
▷ **ADF**, TR 1:00-1:50, Lisa Hickok
▷ **ADG**, TR 2:00-2:50, Nathan Rehfuss
▷ **ADH**, TR 3:00-3:50, Nathan Rehfuss
▷ **ADJ**, TR 9:00-9:50, Dan Schultz
▷ **ADK**, TR 10:00-10:50, Dan Schultz
▷ **ADL**, TR 11:00-11:50, Derrek Yager
▷ **ADM**, TR 12:00-12:50, Derrek Yager
▷ **ADN**, TR 1:00-1:50, Ben Fulan
▷ **ADO**, TR 2:00-2:50, Ben Fulan
▷ **ADP**, TR 3:00-3:50, Mahmood Etedadi Aliabadi
▷ **ADQ**, TR 4:00-4:50, Mahmood Etedadi Aliabadi

	◇	◇	◇	◇														R1	R2	R3	
	Q2	Q3	Q4	Q5		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9			Q1	Q2	Q3	Q4	
	P2	P3	P4	P5		P1	P2	P3	P4	P5	P6	P7	P8	P9			P1	P2	P3	P4	P5
N1	N2	N3	N4	N5		N1	N2	N3	N4	N5	N6	N7	N8	N9	N10		N1	N2	N3	N4	N5
M1	M2	M3	M4	M5		M1	M2	M3	M4	M5	M6	M7	M8	M9	M10		M1	M2	M3	M4	M5
L1	L2	L3	L4	L5		L1	L2	L3	L4	L5	L6	L7	L8	L9	L10		L1	L2	L3	L4	L5
K1	K2	K3	K4	K5		K1	K2	K3	K4	K5	K6	K7	K8	K9	K10		K1	K2	K3	K4	K5
J1	J2	J3	J4	J5		J1	J2	J3	J4	J5	J6	J7	J8	J9	J10		J1	J2	J3	J4	J5
H1	H2	H3	H4	H5		H1	H2	H3	H4	H5	H6	H7	H8	H9	H10		H1	H2	H3	H4	H5
G1	G2	G3	G4	G5		G1	G2	G3	G4	G5	G6	G7	G8	G9	G10		G1	G2	G3	G4	G5
F1	F2	F3	F4	F5		F1	F2	F3	F4	F5	F6	F7	F8	F9	F10		F1	F2	F3	F4	F5
E1	E2	E3	E4	E5		E1	E2	E3	E4	E5	E6	E7	E8	E9	E10		E1	E2	E3	E4	E5
D1	D2	D3	D4	D5		D1	D2	D3	D4	D5	D6	D7	D8	D9	D10		D1	D2	D3	D4	D5
C1	C2	C3	C4	C5		C1	C2	C3	C4	C5	C6	C7	C8	C9	C10		C1	C2	C3	C4	C5
B1	B2	B3	B4	B5		B1	B2	B3	B4	B5	B6	B7	B8	B9	B10		B1	B2	B3	B4	B5
A1	◇	◇	◇	◇		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10		◇	◇	◇	◇	A5

FRONT OF ROOM – 114 David Kinley Hall

1. (5 points) Find $f'(x)$ given that $f(x) = 5x^4 + 2\sec x - 4\cot x + 2e^x + 4\ln x$

2. (5 points) Find $f'(x)$ given that $f(x) = \cos\left(x^3 + 2\right)$

3. (5 points) Find $f'(x)$ given that $f(x) = \dfrac{e^{5x}}{x^3}$

4. (5 points) Find $f'(x)$ given that $f(x) = x^5 \arctan x$

5. (5 points) Find $f'(x)$ given that $f(x) = \tan(\ln(\sin(3x)))$

6. (12 points) Find $\dfrac{dy}{dx}$ given that $x^5y^2 = 6x + 4y$

7. (12 points) Find the equation of the line tangent to the curve $f(x) = 5x^2 + 2x + 3$ at $x = 1$. Write your simplified answer in the form $y = mx + b$.

8. (12 points) Solve the following differential equations given that the graph of each solution goes through the point $(p, w) = (1, 8)$. You must use the given variables.

   (a) $\dfrac{dw}{dp} = 6p$

   (b) $\dfrac{dw}{dp} = 6w$

9. (4 points each) Circle the correct limit. No partial credit. You do not need to show any work.

(a) $\lim_{x\to\infty} \dfrac{2\ln x}{\sqrt[3]{x}}$

(a) $-\infty$ (b) -2 (c) -1 (d) 0 (e) 1 (f) 2 (g) ∞

(b) $\lim_{x\to 0} \dfrac{e^{10x}-1}{5x}$

(a) $-\infty$ (b) -2 (c) -1 (d) 0 (e) 1 (f) 2 (g) ∞

(c) $\lim_{x\to\infty} \dfrac{e^{10x}-1}{5x}$

(a) $-\infty$ (b) -2 (c) -1 (d) 0 (e) 1 (f) 2 (g) ∞

(d) $\lim_{x\to\pi} \dfrac{2\cos x}{(\pi-x)^2}$

(a) $-\infty$ (b) -2 (c) -1 (d) 0 (e) 1 (f) 2 (g) ∞

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

(a) $-\infty$ (b) -2 (c) -1 (d) 0 (e) 1 (f) 2 (g) ∞

10. (10 points) State the interval upon which the graph of $f(x) = \ln(x-4) + \ln(10-x)$ is increasing and the interval upon which it is decreasing.

11. (9 points) For each $x > 0$, a line goes through the point $(0, 0)$ and a point on the curve $y = x^4 e^{-8x}$. Which value of x gives the line with largest slope?

Students – do not write on this page!

1. (5 points) _____
2. (5 points) _____
3. (5 points) _____
4. (5 points) _____
5. (5 points) _____
6. (12 points) _____
7. (12 points) _____
8. (12 points) _____
9. (20 points) _____
10. (10 points) _____
11. (9 points) _____

TOTAL (100 points) _____