

MATH 220

Test 2

Fall 2012

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 11:00-12:50, Hannah Kolb Spinoza	▷ AD2 , TR 9:00-10:50, Ki Yeun Kim
▷ AD3 , TR 1:00-2:50, Michael Santana	▷ ADA , TR 8:00-8:50, Ziyang Pan
▷ ADB , TR 9:00-9:50, Ziyang Pan	▷ ADC , TR 10:00-10:50, Lisa Hickok
▷ ADD , TR 11:00-11:50, Lisa Hickok	▷ ADE , TR 12:00-12:50, Andrew McConvey
▷ ADF , TR 1:00-1:50, Jian Liang	▷ ADG , TR 2:00-2:50, Derrek Yager
▷ ADH , TR 3:00-3:50, Lechao Xiao	▷ ADI , TR 4:00-4:50, Lechao Xiao
▷ ADJ , TR 9:00-9:50, Meghan Galiardi	▷ ADK , TR 10:00-10:50, Meghan Galiardi
▷ ADL , TR 11:00-11:50, Andrew McConvey	▷ ADM , TR 12:00-12:50, Benjamin Fulan
▷ ADN , TR 1:00-1:50, Benjamin Fulan	▷ ADO , TR 2:00-2:50, Jian Liang
▷ ADP , TR 3:00-3:50, Hongfei Tian	▷ ADQ , TR 4:00-4:50, Hongfei Tian
▷ ADR , TR 9:00-9:50, Noah Chartoff	▷ ADS , TR 12:00-12:50, Derrek Yager
▷ ADT , TR 2:00-2:50, Anna Weigandt	▷ ADU , TR 3:00-3:50, Anna Weigandt

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FRONT OF ROOM – 228 Natural History Building
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1. (8 points) Find $f'(x)$ given that $f(x) = 4x^{10} + \frac{1}{\sqrt[4]{x}} - \sec x + \ln x$

2. (8 points) Find $\frac{dv}{dt}$ given that $v = 5t^6 \sin^{-1}(8t)$

3. (8 points) Find $w'(q)$ given that $w(q) = \frac{\sin(q^3)}{q^4 + 9q}$

4. (8 points) Find $g'(t)$ given that $g(t) = e^{\cos^2(4t)}$

5. (8 points) Find $\frac{dy}{dx}$ given that $e^{2y} = x^3y^5 + 6x$

6. (12 points) The graph of one of the solutions to the differential equation $\frac{dy}{dx} = y/2$ passes through the point $(0, 6)$. Determine the x -value at which this graph intersects the line $y = 30$.

7. (12 points) A spherical balloon is inflated at a constant rate of $5 \text{ ft}^3/\text{min}$. How quickly is the balloon's radius increasing at the instant the volume is 20 ft^3 ?

8. (12 points) For the curve $y = e^{4x} - 3e^{-2x}$, give the x -value at which the tangent line has the smallest slope.

9. (12 points) Suppose that a function $f(x)$ has first derivative given by $f'(x) = -2e^{x/2} (x^2 - 7x + 14)$. Determine the largest open interval upon which the graph of $f(x)$ is concave up.

10. (12 points) Evaluate the following limits.

(a) $\lim_{x \rightarrow 1^+} \frac{\sin(5x)}{\ln x}$

(b) $\lim_{x \rightarrow \infty} \frac{\ln x}{x^3}$

(c) $\lim_{x \rightarrow 0^+} \left(\frac{2}{x} - \frac{10}{e^{5x} - 1} \right)$

Students – do not write on this page!

1. (8 points) _____

2. (8 points) _____

3. (8 points) _____

4. (8 points) _____

5. (8 points) _____

6. (12 points) _____

7. (12 points) _____

8. (12 points) _____

9. (12 points) _____

10. (12 points) _____

TOTAL (100 points) _____