MATH 220 **Test 2** **Spring 2015**

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, Andrew McConvey
- ▷ **AD2**, TR 1:00-2:50, Derrek Yager
- ▷ **ADA**, TR 8:00-8:50, Mi Young Jang
- ▷ **ADB**, TR 9:00-9:50, Stephen Berning
- ▷ **ADC**, TR 10:00-10:50, Sarah Yeakel
- ▷ **ADD**, TR 11:00-11:50, Michael Livesay
- ▷ **ADE**, TR 12:00-12:50, George Shakan
- ▷ **ADF**, TR 1:00-1:50, Albert Tamazyan
- ▷ **ADG**, TR 2:00-2:50, Alonza Terry
- ▷ **ADH**, TR 3:00-3:50, Alonza Terry
- ▷ **ADJ**, TR 9:00-9:50, Mi Young Jang
- ▷ **ADK**, TR 10:00-10:50, Stephen Berning
- ▷ **ADL**, TR 11:00-11:50, Adam Wagner
- ▷ **ADM**, TR 12:00-12:50, Adam Wagner
- ▷ **ADN**, TR 1:00-1:50, Mychael Sanchez
- ▷ **ADO**, TR 2:00-2:50, Mychael Sanchez
- ▷ **ADP**, TR 3:00-3:50, Albert Tamazyan
- ▷ **ADQ**, TR 4:00-4:50, George Shakan
- ▷ **ADR**, TR 9:00-9:50, Michael Livesay

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
1	2	3	4	5	6	K																K		1	2	3		
1	2	3	4	5	6	J	J	1	2	3	4	5	6	7	8	9	10	11	12	13	J	J	1	2	3	4	5	6
1	3	2	4	5	6	I	I	1	2	3	4	5	6	7	8	9	10	11	12	13	I	I	1	2	3	4	5	6
1	2	3	4	5	6	H	H	1	2	3	4	5	6	7	8	9	10	11	12	13	H	H	1	2	3	4	5	6
1	2	3	4	5	6	G	G	1	2	3	4	5	6	7	8	9	10	11	12	13	G	G	1	2	3	4	5	6
1	2	3	4	5	6	F	F	1	2	3	4	5	6	7	8	9	10	11	12	13	F	F	1	2	3	4	5	6
1	2	3	4	5	6	E	E	1	2	3	4	5	6	7	8	9	10	11	12	13	E	E	1	2	3	4	5	6
1	2	3	4	5	6	D	D	1	2	3	4	5	6	7	8	9	10	11	12	13	D	D	1	2	3	4	5	6
1	2	3	4	5	6	C	C	1	2	3	4	5	6	7	8	9	10	11	12	13	C	C	1	2	3	4	5	6
1	2	3	4	5	6	B	B	1	2	3	4	5	6	7	8	9	10	11	12	13	B	B	1	2	3	4	5	6
							A	1	2	3								1	2	3	A							

FRONT OF ROOM – 100 Materials Science and Engineering Building

1. (8 points) Find $g'(x)$ given that $g(x) = 10 \arcsin x + 4 \csc(x) - 120 \ln(x) + 6x^8$

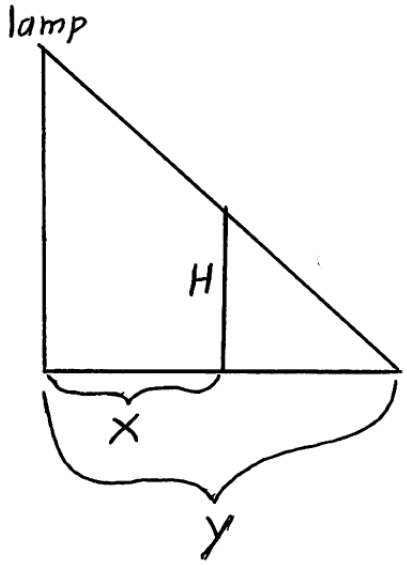
2. (8 points) Find $\dfrac{dw}{dt}$ given that $w = t^7 e^{5t}$

3. (8 points) Find $p'(v)$ given that $p(v) = \cos\left(\sqrt{v^9 + 5v}\right)$

4. (8 points) Find $w'(q)$ given that $w(q) = \dfrac{\cot(5q)}{q^3 + 4}$

5. (8 points) Find $\dfrac{dy}{dx}$ given that $x^4 e^y = 5x^7 + 2y^3 + 42$. It is okay to leave your answer in terms of both x and y.

6. (8 points) As Nancy walks away from a 700 cm lamppost, the tip of her shadow moves 40% faster than she does. What is Nancy's height?



7. (12 points) Solve the following differential equations given that the graph of each solution goes through the point $(\theta, \alpha) = (0, 24)$. You must use the given variables.

   (a) $\dfrac{d\alpha}{d\theta} = 16\alpha$

   (b) $\dfrac{d\alpha}{d\theta} = 16\theta$

8. (10 points) Upon which interval is the function $f(x) = 7x^4 - 4x^3 + 243$ increasing?

9. (10 points) Evaluate the following limit. Simplify your answer.

$$\lim_{x \to 0} \frac{e^{8x} - 8x - 1}{1 - \cos(3x)}$$

10. (10 points) A function $f(x)$ is continuous at each real number and it has the following second derivative.

$$f''(x) = 12\left(e^x + 19\right)(x-5)^8 (x-2)^6 (x+5)^7$$

(a) State each interval upon which the graph of $f(x)$ is concave down.

(b) State each interval upon which the graph of $f(x)$ is concave up.

(c) State each x-value at which the graph of $f(x)$ has an inflection point.

11. (10 points) Suppose $y = \dfrac{8}{x^6}$ for $x > 0$. Determine the x-coordinate for the point on this curve which is closest to the origin.

Students – do not write on this page!

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

TOTAL (100 points) _____