MATH 220 **Test 3** **Spring 2012**

Name _____ **UIN or NetID** _____

(circle your TA discussion section)

- ▷ **AD1**, TR 11:00-11:50, Amita Malik
- ▷ **AD2**, TR 1:00-1:50, Amita Malik
- ▷ **AD3**, TR 1:00-1:50, Neha Gupta
- ▷ **AD4**, TR 1:00-1:50, Meghan Galiardi
- ▷ **AD5**, TR 2:00-2:50, Neha Gupta
- ▷ **AD7**, TR 3:00-3:50, Meghan Galiardi
- ▷ **AD8**, TR 1:00-2:50, Hannah Kolb-Spinoza
- ▷ **AD9**, TR 9:00-10:50, Vicki Reuter

- ▷ **BD1**, TR 2:00-2:50, Stephen Longfield
- ▷ **BD2**, TR 8:00-8:50, Eliana Duarte
- ▷ **BD3**, TR 11:00-11:50, Michael Santana
- ▷ **BD4**, TR 9:00-9:50, Eliana Duarte
- ▷ **BD5**, TR 2:00-2:50, Stephen Berning
- ▷ **BD6**, TR 1:00-1:50, Faruk Temur
- ▷ **BD7**, TR 3:00-3:50, Stephen Berning
- ▷ **BD8**, TR 3:00-3:50, Stephen Longfield

- 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.

263	264	265	266	267	268	269	270	•	271	272	273					278	279	•	280	281	282	283	284	285	286	287
	240	241	242	243	244	245	246	•	247	248	249	250	251	252	253	254	255	•	256	257	258	259	260	261	262	
	217	218	219	220	221	222	223	•	224	225	226	227	228	229	230	231	232	•	233	234	235	236	237	238	239	
	194	195	196	197	198	199	200	•	201	202	203	204	205	206	207	208	209	•	210	211	212	213	214	215	216	
	171	172	173	174	175	176	177	•	178	179	180	181	182	183	184	185	186	•	187	188	189	190	191	192	193	
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	70	71	72	73	74	75	76	•	77	78	79	80	81	82	83	84	85	•	86	87	88	89	90	91	92	
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	24	25	26	27	28	29	30	•	31	32	33	34	35	36	37	38	39	•	40	41	42	43	44	45	46	
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FRONT OF ROOM – 314 Altgeld Hall

1. (10 points) Find a formula for $f(x)$ given that $f''(x) = 3\sin x$, $f(0) = 15$ and $f'(0) = 2$.

2. (10 points) Fill in the missing information for the following theorem.

Mean Value Theorem Let f be a function that satisfies the following two hypotheses:

(1) f is _____ on the closed interval $[a, b]$.

(2) f is _____ on the open interval (a, b).

Then there is a number c in (a, b) such that _____ .

3. (10 points) Evaluate the definite integral. Simplify your answer.

$$\int_{-5}^{5} \left(7x^9 - 3x^5 + 4\right)\, dx$$

4. (10 points) Evaluate the definite integral. Simplify your answer.

$$\int_{0}^{4} \frac{10x}{\sqrt{x^2 + 9}}\, dx$$

5. (10 points) Evaluate the indefinite integral.

$$\int \frac{e^{4x}}{1+e^{4x}}\,dx$$

6. (10 points) Evaluate the indefinite integral.

$$\int \frac{8-6\cos^3 x}{2\cos^2 x}\,dx$$

7. (10 points) Evaluate the indefinite integral.

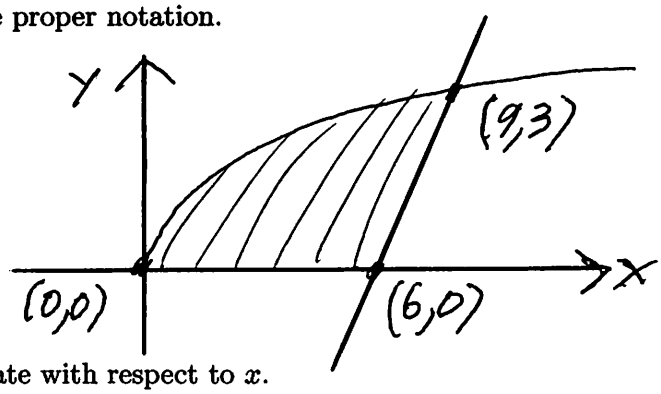
$$\int \sin^5 x \, dx$$

8. (10 points) Suppose f is a polynomial and the graph of $y = f(x)$ goes through points $(0, 4)$, $(1, 3)$, $(2, 14)$, $(3, 67)$ and $(4, 216)$. Evaluate the following quantities and simplify your answer.

   (a) $\displaystyle\int_1^2 f'(x) \, dx$

   (b) $\displaystyle\int_1^2 f'(2x) \, dx$

9. (10 points) Let **R** be the finite region in the first quadrant which is bounded by the graphs of $y = \sqrt{x}$ and $y = x - 6$. In the following manner set up, but do not evaluate, definite integrals which represent the volume of the solid obtained when **R** is revolved around the vertical line $x = 15$. Use proper notation.



(a) Integrate with respect to x.

(b) Integrate with respect to y. (The integrands in parts (a) and (b) should be different.)

10. (10 points) The graphs of $y = x^3$ and $y = 5 - x^2$ intersect somewhere on the interval $[1, 2]$. To estimate the x-value for this point of intersection, begin with an initial estimate of $x_1 = 1$ and determine a second estimate x_2 by applying Newton's Method to an appropriate function. Show all work and write your answer either in decimal form or as a simplified fraction.

Students – do not write on this page!

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

TOTAL (100 points) _____