Name: _____

Instructor: _____

Math 10550, Exam III
November 18, 2008

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- No calculators.
- The exam lasts for 1 hour and 15 min.
- Be sure that your name is on every page in case pages become detached.
- Be sure that you have all 9 pages of the test.

PLEASE MARK YOUR ANSWERS WITH AN X, not a circle!

1.	(a)	(b)	(c)	(d)	(e)
2.	(a)	(b)	(c)	(d)	(e)
3.	(a)	(b)	(c)	(d)	(e)
4.	(a)	(b)	(c)	(d)	(e)
5.	(a)	(b)	(c)	(d)	(e)
6.	(a)	(b)	(c)	(d)	(e)
7.	(a)	(b)	(c)	(d)	(e)
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9.	(a)	(b)	(c)	(d)	(e)
10.	(a)	(b)	(c)	(d)	(e)

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Multiple Choice	_____
11.	_____
12.	_____
13.	_____
Total	_____

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Multiple Choice

1.(7 pts.) In finding an approximate solution to the equation $x^3 + 2x - 4 = 0$ using Newton's method with initial approximation $x_1 = 1$, what is x_2?

(a) -4 (b) $6/5$ (c) 6 (d) 0 (e) $-1/5$

2.(7 pts.) A box with a square base and open top must have a volume of 32 cm^3. Find the dimensions of the box that minimize the surface area of the box.

(a) $\sqrt[3]{32}\,cm \times \sqrt[3]{32}\,cm \times \sqrt[3]{32}\,cm$

(b) $\sqrt{8}\,cm \times \sqrt{8}\,cm \times 4\,cm$

(c) $2\,cm \times 2\,cm \times 8\,cm$

(d) $2\sqrt{8}\,cm \times 2\sqrt{8}\,cm \times \sqrt{8}\,cm$

(e) $4\,cm \times 4\,cm \times 2\,cm$

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3.(7 pts.) Calculate the following indefinite integral

$$\int \frac{x^2 - 2\sqrt{x}}{x} dx =$$

(a) $\frac{x^2}{2} - x^{1/2} + C$ (b) $\frac{x^2}{2} - 4x^{1/2}$ (c) $\frac{x^2}{2} - 4x^{1/2} + C$

(d) $x^2 - x^{1/2} + C$ (e) $x^2 - 4x^{1/2} + C$

4.(7 pts.) Calculate the following definite integral

$$\int_{-\pi/2}^{\pi/2} |\sin x| dx =$$

(a) 1 (b) 0 (c) 3 (d) 2 (e) -2

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5.(7 pts.) What is the indefinite integral

$$\int \frac{\cos x}{(\sin x - 1)^2} dx = ?$$

(a) $\dfrac{\cos x}{\sin x - 1} + C$ (b) $\dfrac{\cos x}{\sin x - 1}$ (c) $\dfrac{-1}{\sin x - 1} + C$

(d) $\dfrac{1}{\sin x - 1} + C$ (e) $-\sin x + 1 + C$

6.(7 pts.) The equation of the slant asymptote of the curve $y = \dfrac{2x^3 + x^2 + 3}{x^2 + 1}$ is:

(a) $y = 2x - 1$ (b) $y = 3x + 1$ (c) $y = -2x + 2$

(d) $y = 2x$ (e) $y = 2x + 1$

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7.(7 pts.) A table of values for a function f is given below.

t	0	2	4	6
$f(t)$	1	2	4	5

Use 3 rectangles and right endpoints to estimate the value of the integral

$$\int_0^6 f(t)\,dt.$$

(a) 7 (b) 14 (c) 24 (d) 22 (e) 11

8.(7 pts.) Let $g(x) = \displaystyle\int_0^{(\sin x)^3} \sqrt{1+t^2}\,dt$. Find $g'(x)$.

(a) $3(\sin x)^2 \cos x\sqrt{1+(\sin x)^3}$ (b) $3(\sin x)^2 \cos x\sqrt{1+(\sin x)^6}$

(c) $(\sin x)^2 \cos x\sqrt{1+(\sin x)^6}$ (d) $\sqrt{1+(\sin x)^6}$

(e) $3(\sin x)^3\sqrt{1+(\sin x)^6}$

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9.(7 pts.) Calculate the integral $\int_0^2 3x^2\sqrt{x^3+1}\,dx$

(a) 52/3 (b) 2/3 (c) 26 (d) 33 (e) 26/3

10.(7 pts.) Which of the following is a Riemann sum corresponding to the integral $\int_0^1 \cos x dx$

(a) $\frac{1}{2n}\sum_{i=1}^{n}\cos\left(\frac{2i}{n}\right)$ (b) $\frac{2}{n}\sum_{i=1}^{n}\cos\left(\frac{i}{n}\right)$ (c) $\frac{1}{n}\sum_{i=1}^{n}\cos\left(\frac{i}{n}\right)$

(d) $\frac{2}{n}\sum_{i=1}^{n}\cos\left(\frac{2i}{n}\right)$ (e) $\frac{1}{n}\sum_{i=1}^{n}\cos\left(\frac{2i}{n}\right)$

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Partial Credit

You must show your work on the partial credit problems to receive credit!

11.(10 pts.)

(a) Evaluate the definite integral $\int_0^2 x^3 dx$ using the **definition** of the definite integral.

Hint: $\sum_{i=1}^{n} i^3 = \left[\frac{n(n+1)}{2}\right]^2$

(b) Verify your result using the Fundamental Theorem of Calculus.

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12.(10 pts.) Find the **points** on the ellipse $4x^2 + y^2 = 4$ that are farthest away from the point $(1, 0)$. (Note that there may be more than one!)

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13.(10 pts.) Find the indefinite integral

$$\int (x^3(x^2+1)^2 + \cos x \sin x)dx.$$

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