Name: _____

Instructor: _____

Math 10550, Exam III
November 13, 2012

- The Honor Code is in effect for this examination. All work is to be your own.
- 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)
8.	(a)	(b)	(c)	(d)	(e)
9.	(a)	(b)	(c)	(d)	(e)
10.	(a)	(b)	(c)	(d)	(e)

Please do NOT write in this box.

Multiple Choice_____

11. _____

12. _____

13. _____

Total _____

Name: _____

Instructor: _____

Multiple Choice

1.(6 pts.) In finding an approximate solution to the equation $x^4 + x - 2 = 0$ using Newton's Method with initial approximation $x_1 = -1$, what is x_2?

(a) $-\frac{1}{3}$ (b) $-\frac{1}{5}$ (c) $-\frac{5}{2}$ (d) $-\frac{5}{3}$ (e) $-\frac{7}{3}$

2.(6 pts.) If $f'(x) = \sqrt{x} + \frac{1}{\sqrt{x}}$ and $f(1) = \frac{8}{3}$, find $f(4)$.

(a) $\frac{27}{3}$ (b) $\frac{25}{3}$ (c) $\frac{26}{3}$ (d) $\frac{24}{3}$ (e) $\frac{28}{3}$

Name: _____

Instructor: _____

3.(6 pts.) Calculate the following indefinite integral

$$\int (4-3t^2)(4t+1)dt.$$

(a) $-36t^2+16+C$

(b) $-2t^5-t^4+8t^3+4t^2+C$

(c) $-3t^4-t^3+8t^2+4t+C$

(d) $-12t^4-3t^3+16t^2+4t+C$

(e) $-\frac{3}{4}t^4-t^3+8t^2+4t+C$

4.(6 pts.) Let $f(x)=\int_{\sin x}^{2}\frac{1}{\sqrt{t^4+6}}dt$. What is $f'(x)$?

(a) $\frac{1}{\sqrt{\sin^4 x+6}}$

(b) $\frac{-1}{\sqrt{\sin^4 x+6}}$

(c) $\frac{\cos x}{\sqrt{\sin^4 x+6}}$

(d) $\frac{-2\sin^3 x}{\sqrt{(\sin^4 x+6)^3}}$

(e) $\frac{-\cos x}{\sqrt{\sin^4 x+6}}$

Name: _____

Instructor: _____

5.(6 pts.) Evaluate the indefinite integral

$$\int \frac{\sec^2(\sqrt{x})}{\sqrt{x}} dx.$$

(a) $\tan^2(\sqrt{x}) + C$

(b) $\frac{1}{2}\sec(\sqrt{x})\tan(\sqrt{x}) + C$

(c) $2\tan(\sqrt{x}) + C$

(d) $2\sec(\sqrt{x})\tan(\sqrt{x}) + C$

(e) $\frac{1}{2}\tan(\sqrt{x}) + C$

6.(6 pts.) Evaluate the definite integral $\int_0^1 x^2(\sqrt{x}+3)dx$.

(a) $\frac{5}{2}$ (b) $\frac{9}{7}$ (c) $\frac{7}{5}$ (d) $\frac{5}{3}$ (e) $\frac{9}{2}$

Name: _____

Instructor: _____

7.(6 pts.) Calculate the definite integral

$$\int_{-1}^{2} |x| dx.$$

(a) $\frac{5}{2}$ (b) 1 (c) $\frac{9}{2}$

(d) $\frac{7}{2}$ (e) $\frac{3}{2}$

8.(6 pts.) Evaluate the definite integral

$$\int_{0}^{\pi} (2x+1)\sin(x^2+x) dx.$$

(a) $2\cos(\pi^2+\pi) - 2$ (b) $\sin(\pi^2+\pi) - 1$

(c) $1 - \cos(\pi^2+\pi)$ (d) $\cos(\pi+1) - \cos(\pi^2)$

(e) 0

Name: _____

Instructor: _____

9.(6 pts.) Find the equation of the slant asymptote of the curve

$$y = \frac{2x^3 - 3x^2 + 4x + 6}{x^2 + 2x}.$$

(a) $y = 2x + 1$ (b) $y = 2x - 7$ (c) $y = 2x + 4$

(d) $y = 2x - 3$ (e) $y = 0$

10.(6 pts.) Let $A = \int_0^1 \frac{x}{x+1} dx$. Which of the following is true of A?

(a) A is undefined (b) $-\frac{1}{4} \leq A \leq 0$ (c) $\frac{1}{2} \leq A \leq \frac{3}{4}$

(d) $0 \leq A \leq \frac{1}{2}$ (e) $A = \frac{1}{4}$

Name: _____

Instructor: _____

Partial Credit

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

11.(14 pts.) (1) Using the definition of the definite integral, evaluate

$$\int_0^2 1 + x^2 dx.$$

Hint:

$$1^2 + 2^2 + \cdots + n^2 = \frac{1}{6} n(n+1)(2n+1).$$

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

Name: _____

Instructor: _____

12.(13 pts.) A ball is thrown upward from a height of 32 feet above the ground on the planet Calculuto, with an initial velocity of 12 feet per second. The velocity of the ball at time t is $12 - 4t$ feet per second.

(1) Find $s(t)$, the function giving the height of the ball at time t.

(2) How long will the ball take to reach the ground?

(3) How high will the ball go?

Name: _____

Instructor: _____

13.(13 pts.) An open rectangular box (a box with no top) with square base and with a volume of 27 cubic feet is needed. Material for the base costs \$2 per square foot, and material for the sides costs \$1 per square foot. Determine the dimensions of the box that will minimize the cost of materials. *Justify that your answer is a minimum.*

Name: _____

Instructor: ANSWERS

Math 10550, Exam III
November 13, 2012

- The Honor Code is in effect for this examination. All work is to be your own.
- 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)	(•)	(e)
2.	(a)	(b)	(c)	(d)	(•)
3.	(a)	(b)	(•)	(d)	(e)
4.	(a)	(b)	(c)	(d)	(•)
5.	(a)	(b)	(•)	(d)	(e)
6.	(a)	(•)	(c)	(d)	(e)
7.	(•)	(b)	(c)	(d)	(e)
8.	(a)	(b)	(•)	(d)	(e)
9.	(a)	(•)	(c)	(d)	(e)
10.	(a)	(b)	(c)	(•)	(e)

Please do NOT write in this box.

Multiple Choice_____

11. _____

12. _____

13. _____

Total _____