Name: _____

Instructor: _____

Math 10560, Exam 2.
March 18, 2008

- 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 10 pages of the test.
- Trigonometric formulas are provided in the last page.

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)

Please do NOT write in this box.

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

Name: _____

Instructor: _____

Multiple Choice

1.(6 pts.) Which of the following expressions gives the partial fraction decomposition of the function

$$f(x) = \frac{3x^2 + 2x + 1}{(x-1)(x^2-1)(x^2+1)}?$$

(a) $\dfrac{A}{x-1} + \dfrac{B}{(x-1)^2} + \dfrac{C}{x+1} + \dfrac{D}{x^2+1}$

(b) $\dfrac{A}{(x-1)^2} + \dfrac{B}{x+1} + \dfrac{Cx+D}{x^2+1}$

(c) $\dfrac{A}{x-1} + \dfrac{Bx+C}{x^2-1} + \dfrac{Dx+E}{x^2+1}$

(d) $\dfrac{A}{x-1} + \dfrac{B}{(x-1)^2} + \dfrac{C}{x+1} + \dfrac{Dx+E}{x^2+1}$

(e) $\dfrac{A}{x-1} + \dfrac{B}{x^2-1} + \dfrac{C}{x^2+1}$

2.(6 pts.) Use the Trapezoidal rule with step size $\Delta x = 1$ to appoximate the integral $\int_0^4 f(x)dx$ where a table of values for the function $f(x)$ is given below.

x	0	1	2	3	4
$f(x)$	2	1	2	3	5

(a) 9 (b) 9.5 (c) 11 (d) 8 (e) 10.4

Name: _____

Instructor: _____

3.(6 pts.) Evaluate the integral $\int_2^\infty xe^{-x}\,dx$.

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

4.(6 pts.) Compute the integral

$$\int_{-3}^{3} \frac{1}{(x+2)^3}\,dx.$$

(a) divergent (b) $-\frac{13}{25}$ (c) $\frac{12}{25}$ (d) $\frac{13}{25}$ (e) 0

Name: _____

Instructor: _____

5.(6 pts.) Compute the integral

$$\int_0^{\frac{\pi}{2}} \cos\left(\cos(x)\right)\sin(x)\,dx.$$

(a) $1-\cos(1)$ (b) $\cos(1)$ (c) $\sin(1)$

(d) $\cos(1)-1$ (e) $-\sin(1)$

6.(6 pts.) Which of the following is an expression of the area of the surface formed by rotating the curve $y=\sin x$ between $x=0$ and $x=\dfrac{\pi}{2}$ about the x-axis?

(a) $2\pi\displaystyle\int_0^{\frac{\pi}{2}} \sqrt{1+\cos^2 x}\,dx$

(b) $2\pi\displaystyle\int_0^{1} \sin^{-1}(y)\sqrt{\frac{2-y^2}{1-y^2}}\,dy$

(c) $2\pi\displaystyle\int_0^{\frac{\pi}{2}} x\sqrt{1+\cos^2 x}\,dx$

(d) $2\pi\displaystyle\int_0^{\frac{\pi}{2}} \sin x\sqrt{1+\cos^2 x}\,dx$

(e) $2\pi\displaystyle\int_0^{1} \sqrt{\frac{2-y^2}{1-y^2}}\,dy$

Name: _____

Instructor: _____

7.(6 pts.) Find the centroid of the region bounded by $y = e^x$, $y = 0$, $x = 0$ and $x = 1$.

(a) $\left(1, \dfrac{e^2-1}{4}\right)$

(b) $\left(\dfrac{e+1}{4}, \dfrac{1}{e-1}\right)$

(c) $\left(e-1, \dfrac{e^3-e^2-e+1}{4}\right)$

(d) $\left(\dfrac{1}{e-1}, \dfrac{e^2-3}{4(e-1)}\right)$

(e) $\left(\dfrac{1}{e-1}, \dfrac{e+1}{4}\right)$

8.(6 pts.) Use Euler's method with step size 0.5 to estimate $y(2)$ where $y(x)$ is the solution to the initial value problem

$$y' = (x-1)(y-x), \qquad y(1) = 2.$$

(a) 2.5 (b) 2 (c) 2.125 (d) 2.25 (e) 2.375

Name: _____

Instructor: _____

9.(6 pts.) Compute the arc length of the curve

$$y = \tfrac{2}{3}x^{3/2}$$

from $x = 0$ to $x = 3$.

(a) $2\sqrt{3}$ (b) $\frac{15}{2}$ (c) $\frac{28\pi}{3}$ (d) $\sqrt{11}$ (e) $\frac{14}{3}$

Name: _____

Instructor: _____

Partial Credit

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

10. (12 pts.) Compute the integral

$$\int \frac{x^2 + 2x}{x^2 - 1}\, dx.$$

Name: _____

Instructor: _____

11. (12 pts.) Evaluate the integral

$$\int_0^1 (1-\sqrt{x})^8\,dx.$$

Name: _____

Instructor: _____

12. (10 pts.) Find the solution to the initial value problem

$$(1-x)y' - y^2 = 1, \qquad y(2) = 1.$$

Name: _____

Instructor: _____

13. (12 pts.) Solve the initial value problem

$$y' = \frac{2x - y}{1 + x}, \qquad y(1) = 2.$$

Name: _____

Instructor: ANSWERS

Math 10560, Exam 2.
March 18, 2008

- 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 10 pages of the test.
- Trigonometric formulas are provided in the last page.

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

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

Please do NOT write in this box.

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