Name: _____

Instructor: _____

Math 10560, Practice Exam 2.
March 11, 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 9 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)

Please do NOT write in this box.

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

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Multiple Choice

1.(7 pts.) Which of the following expressions gives the partial fraction decomposition of the function

$$f(x) = \frac{x^2 - 2x + 6}{x^3(x-3)(x^2+4)}?$$

(a) $\dfrac{A}{x^3} + \dfrac{B}{x-3} + \dfrac{Cx+D}{x^2+4}$

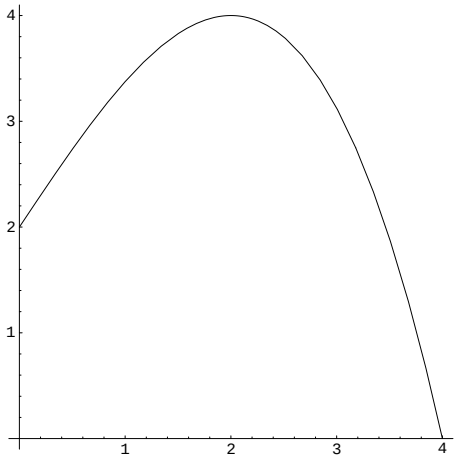
(b) $\dfrac{A}{x^3} + \dfrac{B}{x^2} + \dfrac{C}{x} + \dfrac{D}{x-3} + \dfrac{E}{x^2+4}$

(c) $\dfrac{A}{x^3} + \dfrac{B}{x^2} + \dfrac{C}{x} + \dfrac{D}{x-3} + \dfrac{Ex+F}{x^2+4}$

(d) $\dfrac{A}{x^3} + \dfrac{B}{x-3} + \dfrac{C}{x^2+4}$

(e) $\dfrac{A}{x^3} + \dfrac{B}{x^2} + \dfrac{C}{x} + \dfrac{D}{x-3} + \dfrac{E}{x+2} + \dfrac{F}{x-2}$

2.(7 pts.) Use the trapezoidal rule with step size $\Delta x = 2$ to approximate the integral $\int_0^4 f(x)dx$ where the graph of the function $f(x)$ is given below.



(a) 8 (b) 6 (c) 12 (d) 10 (e) 14

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3.(7 pts.) Evaluate the following improper integral:

$$\int_e^\infty \frac{1}{x(\ln x)^2}dx$$

(a) $\frac{1}{e}$ (b) -1 (c) 1 (d) divergent (e) 0

4.(7 pts.) Find $\int_{-2}^{2} \frac{1}{x+1}dx$.

(a) $\frac{1}{2}\ln 3$ (b) $\ln 3$ (c) $\frac{8}{9}$ (d) 0 (e) diverges

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5.(7 pts.) Which of the following is an expression for the area of the surface formed by rotating the curve $y = 5^x$ between $x = 0$ and $x = 2$ about the y-axis?

(a) $\displaystyle\int_1^{25} 2\pi y \sqrt{1 + \frac{1}{y^2 \ln(25)}}\, dy$

(b) $\int_0^2 2\pi x \sqrt{1 + (\ln 5)^2 \cdot 25^x}\, dx$

(c) $\displaystyle\int_1^{25} 2\pi y \sqrt{1 + \frac{1}{y^2 (\ln 5)^2}}\, dy$

(d) $\int_0^2 2\pi x \sqrt{1 + 5^{2x}}\, dx$

(e) $\int_0^2 2\pi 5^x \sqrt{1 + (\ln 5)^2 \cdot 5^{2x}}\, dx$

6.(7 pts.) Find the centroid of the region bounded by $y = 1/x$, $y = 0$, $x = 1$, and $x = 2$.

(a) $(\ln \frac{1}{2}, 4 \ln \frac{1}{2})$ (b) $(\frac{1}{\ln 2}, \frac{1}{2})$ (c) $(\frac{3}{\ln 2}, \frac{1}{4 \ln 2})$

(d) $(3 \ln \frac{1}{2}, 4 \ln \frac{1}{2})$ (e) $(\frac{1}{\ln 2}, \frac{1}{4 \ln 2})$

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7.(7 pts.) Use Euler's method with step size 0.5 to estimate $y(1)$ where $y(x)$ is the solution to the initial value problem

$$y' = y + 2xy, \qquad y(0) = 1.$$

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

8.(7 pts.) The solution to the initial value problem

$$y' = \frac{\sin x}{2y+1} \qquad y(0) = 2$$

is given by

(a) $y^2 + y = 7 - \cos x$

(b) $y^2 + y = 2 - \cos x$

(c) $2y + 1 = 5e^{-\cos x}$

(d) $2y + 1 = 6 - e^{-\cos x}$

(e) $y^2 + y = 5 + \cos x$

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Partial Credit

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

9.(11 pts.) Find the integral

$$\int \frac{3x+1}{x^3+x^2}dx.$$

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10.(11 pts.) Calculate the integral

$$\int \frac{dx}{x + \sqrt[3]{x}}.$$

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11.(11 pts.) Calculate the arc length of the curve if $y = \dfrac{x^2}{4} - \ln(\sqrt{x})$, where $2 \leq x \leq 4$.

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12.(11 pts.) Solve the initial value problem

$$xy' + xy + y = e^{-x}$$
$$y(1) = \frac{2}{e}.$$

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