Math 126: Calculus II Name:_____
Exam II *November 14, 2002* Instructor:_____

There are 6 problems on 7 pages (including the cover page) worth a total of 90 points. You start with 10 points. Unless otherwise indicated, each part of a problem is worth the same number of points.

You may use a calculator if you wish.

To receive partial credit on a problem, you must *show your work* including *all important steps*. No credit will be given for an answer if no work is shown.

1.	_____
2.	_____
3.	_____
4.	_____
5.	_____
6.	_____
+	10
Total	_____

Name:_____

1. (15 points) Let C be the curve $y = \cos x$ for $0 \leq x \leq \dfrac{\pi}{2}$.

   (a) Set up, but do not evaluate, a definite integral for the arc length of C.

   (b) Set up, but do not evaluate, a definite integral for the area of the surface of revolution obtained by rotating C about the x-axis.

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2. (10 points) Solve the initial value problem

$$x^2y' + 4xy + 1 = 0, \qquad y(1) = 0.$$

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3. (20 points)

(a) Determine whether the **sequence**

$$a_n = \frac{\ln(n+3)}{(n+3)}$$

converges or diverges. If it converges, find the limit.

(b) Determine whether the series

$$\sum_{n=1}^{\infty} \frac{\ln(n+3)}{(n+3)^2}$$

is convergent or divergent.

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4. (20 points)

(a) Find $\sum_{n=1}^{\infty}(-1)^{n-1}\frac{8^{n-1}}{3^{2n}}$.

(b) Determine whether the series $\sum_{n=1}^{\infty}(-1)^{n}\frac{n^2}{4^n}$ is convergent or divergent.

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5. (15 points) Determine whether the series

$$\sum_{n=2}^{\infty}(-1)^n\frac{\sqrt{n+1}}{n}$$

is absolutely convergent, conditionally convergent or divergent.

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6. (10 points) Determine whether

$$\int_1^\infty \frac{2+\cos x}{x}\,dx$$

is convergent or divergent.