Final Exam
Math 22 Spring 2008

Please be sure to include your name at the top of each page that you hand in.

Be concise and clear when writing your solutions. You may use a half sheet of notebook paper with notes written on both sidees. Good luck!

Name:

Problem 1

For the parametic curve defined below, find the points on the coordinate axes that the curve intercepts, as well as the points on the curve with horizontal or vertical tangent lines. Use this information to sketch the curve.

$$x = t^3 - t$$
$$y = t^2 - 1$$

Name:

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Problem 2

The curve in Problem 1 has a loop. Find the area enclosed by this loop.

Name:

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Problem 3

Sketch the polar curve $r = \cos^2 \theta$.

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Problem 4

Write out, but do not evaluate, an integral representing the total arclength of the curve in Problem 3.

Name:

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Problem 5

Find the fourth degree Taylor polynomial of $\cos^2 x$, centered at $x = 0$.

Name:

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Problem 6

If we approximate $\sum_{n=1}^{\infty} \frac{(-1)^{n-1}}{\sqrt{n}}$ by adding together the first N terms, use the alternating series test to find N such that the error is less than one tenth.

Name:

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Problem 7

Evaluate the following limit.

$$\lim_{x \to 0} \frac{\cos^2 x - 1 + x^2}{x^4}$$

Name:

Name:

Problem 8

Determine whether the following series converges. If it converges find its value.

$$1 - \pi + \frac{\pi^2}{2!} - \frac{\pi^3}{3!} + \cdots$$

Name: