MATH 122
Practice Exam 1

Name: _____

Instructions:

1. Print your name on this page in the space provided.
2. **You must CIRCLE your final answer.**
3. Show all work, **write down the formulas used and explain in words what you are doing**, partial credit will be given for written work only. **Answers with no work will NOT be given full credit. Neatness counts.**
4. Use of notes, books, OR calculators is not allowed.
5. Useful Identities:

$$\sin^2(x) = \frac{1}{2}(1 - \cos(2x))$$
$$\cos^2(x) = \frac{1}{2}(1 + \cos(2x))$$
$$\sin^2(x) + \cos^2(x) = 1$$
$$\tan(x) = \frac{\sin(x)}{\cos(x)}$$

6. Good luck!

	Score
1	/10
2	/10
3	/10
4	/10
5	/10
6	/10
7	/10
8	/0
Total	/70

Problem 1 (10 points)

Use partial fractions to evaluate:

$$\int \frac{1}{x^3 - 9x^2}\, dx$$

Problem 2 (10 points)

Evaluate the following integral using integration by parts.

$$\int ye^{3y}\,dy$$

Problem 3 (10 points)

Evaluate the following improper integral.

$$\int_0^\infty xe^{-x^2}\,dx$$

Problem 4 (10 points)

Evaluate the following integral using substitution.

$$\int y^7(y^8+8)^{32}\,dy$$

Problem 5 (10 points)

Evaluate the following indefinite integral using the method of your choice. You must state what method you are using!

$$\int e^y \cos(y)\, dy$$

Problem 6 (10 points)

Evaluate the following definite integral using the method of your choice.You must state what method you are using!

$$\int_0^3 \frac{1}{(x-2)^2}\, dx$$

Problem 7 (10 points)

Evaluate the following integral using trigonometric substitution.

$$\int \frac{1}{\sqrt{1-4x^2}}\,dx$$

Problem 8 (0 points)
EXTRA CREDIT 5 POINTS

Starting from the product rule for differentiation, derive the formula for integration by parts. You must show all your work to get credit, no partial credit.