TERM TEST TWO

MATH 101, Winter 2000

Friday, March 3, 2000

NAME AND STUDENT NUMBER:

1. Write down all necessary work. Use the back side of the sheets, if needed.
2. Calculators are allowed, but not needed (and not recommended).
3. Maximum Possible Score = 30 (six questions, 5 marks each).

1. Trigonometric substitution.

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

2. Write out the general form of the partial fraction decomposition of the function

$$\frac{x^2-6x+9}{(x^2-6x+8)^2(x^2-6x+10)^2}.$$

DO NOT SOLVE for the coefficients.

3. Partial fractions.

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

4. Rationalizing substitution.

$$\int \frac{1}{1 + \cos x} \, dx.$$

5. Find the length of the curve defined as $x = 3t - t^3$, $y = 3t^2$, $0 \le t \le 3$.

6. What is the connection between polar and Cartesian coordinates? Show that $r = 6\cos\theta + 8\sin\theta$ is the equation of a circle and find its center and radius.