TECHNICAL CALCULUS

Exam 3

April 15, 1994

1. $x^2 + y^2 = 7 - 6y$; write this equation in polar coordinates.

2. Plot the curve $r = 4(1 + \sin\theta)$.

3. Find the area bounded by $r = e^{\phi}$, $\phi = 0$, $\phi = 2\pi$.

4. A ball is dropped from the height $8m$ and on each rebound it rises one half of the height it last fell. What is the total distance it travels?

5. Find three first nonzero terms of the Maclaurin series for $f(x) = \sqrt{1 + x}$.

6. Calculate $\int_0^1 \sin(x^2)dx$ using two terms of the Maclaurin series.

7. Find Taylor series for e^{2x} about $x_0 = 1$.

8. Calculate $\sin 5^\circ$ approximately.

9. Find the Fourier series for $f(x) = \sin 5x$.

10. Expand $\sin^2 x + \cos^2 2x$ in the Fourier series.