

TERM TEST ONE
MATH 101, Fall 1998
Friday, Oct. 9, 1998

NAME AND STUDENT NUMBER:

1. Write down all your work.
2. Calculators are allowed, but NOT NEEDED.
3. Maximum Possible Score = 50 (five questions, 10 marks each)

1. (a) Solve the equation

$$e^{2+\ln x} = 1.$$

(b) Find

$$\lim_{x \rightarrow 2^-} e^{\frac{1}{x-2}}.$$

2. Find the area bounded by the curves $y = e^x$, $y = e^{3x}$, and $x = 1$.

3. Find the volume of the solid generated by rotating the region bounded by $y = 4x - x^2$ and $y = 2(4x - x^2)$ about the y -axis.

4. A tank has the shape of a right cylinder with height 5m and base radius 2m. It is filled with water to a height of 4m. Find the work required to empty the tank by pumping all of the water to the top of the tank. (The acceleration due to gravity is 9.8 m/s^2 .)

5. Evaluate the integral

$$\int e^{3x} \cos x \, dx.$$