Math 172 **Quiz 4** **Spring 2008**

Name _____

1. (2 points) Given that $\frac{dw}{dt} = \sqrt{w}$ and $w(0) = 81$, use Euler's Method with $\Delta t = 2$ to obtain an estimate for $w(10)$.

2. (2 points) Suppose that the population of a town is always growing at a rate which is proportional to the population itself. Suppose further that the population is currently 400 and is growing at a rate of 25 people per year. Find a differential equation with initial condition to model the population of this town. Use P for the population t years from now.

3. (2 points) Suppose that 800 rabbits are currently on an island. Let R represent the number of rabbits on this island t months from now. Write down a differential equation with initial value to model the number of rabbits on this island under the following conditions.

   (a) This rabbit population increases by 20 rabbits per month.

   (b) This rabbit population increases at a continuous growth rate of 2.5% per month.

4. (2 points) Determine an explicit formula for the rabbit population in problem (3a).

5. (2 points) Determine an explicit formula for the rabbit population in problem (3b).