Homework Due Wednesday September 27

1. Reread sections 2.1 and 2.2 pages 53–76. You are responsible for knowing this material.

2. Rats are not native to the South Seas. Thus consider a small South Sea island that was without any population of rats until the last century when a ship landed for water and 20 rats jumped ship and started a population on the island. The *per capita* growth a population of rates in the wild is 1.9 rats per year per rat. Use the Maple program `population.ms` to answer the following.

   (a) What is the rate equation for the growth of the population of rates? Label all variable.

   (b) Using Euler's method with twelve steps estimate the number of rats after one year. (Here we are using step of length one month.)

   (c) Use Euler's method with 365 steps to estimate the number of rates at the end of one year.

   (d) By increasing the number of steps in Eulers method find an estimate for the number of rats at the end of a year that you think is accurate to the nearest whole number of rats.

   (e) Using the same method give an estimate for the number of rats after five years.

3. Do problem 3 on the sheet One-a-Day Optimization Problems.

The First Group Project is due the Thursday