Please do problems Chapter 4, problems 5 and 8. Also complete the following two problems (from an old midterm exam).

1) In a certain country, the age-specific pattern of fertility is as follows: women have one child at age 33, one child at age 34, one child at age 35, one child at age 36, and one child at age 37. Half of all children born are girls. 20% of children die immediately after birth. Everyone else lives until age 100. There is no immigration or emigration.

A. What is the TFR?
B. What is life expectancy at birth?
C. What is the NRR?
D. Suppose that the country has had the above demographic scenario for a very long time. What will be the ratio of 35 year olds to 70 year olds in the country? Explain how you figured this out. Note that you will have to make a very minor approximation to answer this question.
E. What is the approximate annual growth rate of the population? You should not use a calculator or computer to answer this question!

2) There are two islands, called A and B. On both islands, output is produced with labor and land. The two islands have identical endowments of land. The two islands also have the same production processes, and thus the relationship between total population and output per capita on the two islands is the same. However, the two islands differ in how the growth rate of population is related to the level of income per capita. The equations are:

Island A: \( \text{NRR} = 0.5 + \frac{y}{1000} \)

Island B: \( \text{NRR} = \frac{y}{500} \)

A) How do the steady state levels of population on the two islands compare?
B) Suppose that on each island, half the population was wiped out by a meteor shower in the year 1950. Prior to this unfortunate incident, both islands were at their steady states. Draw a graph showing what income per capita looks like on the two islands over time (that is, starting before 1950, and continuing for many years afterward). You should clearly indicate how the levels of GDP per capita on the two islands compare to each other.