Sample Population Problems

Here are some handy equations to help you with the problems on the back of this sheet. You will need to be familiar with the equations for your test and the AP exam.

1. Population density:

$$\frac{\text{Population}}{\text{AREA}} = \text{Population Density}$$

for example: $\dfrac{270{,}000{,}000 \text{ people}}{9{,}166{,}605 \text{ sq. km}} = 29$ people per square kilometer

2. Birth or Death Rates:

$$\frac{\text{\# of births/deaths per year}}{\text{Total population}} = \text{birth or death rate}$$

for example: $\dfrac{23{,}452 \text{ births}}{942{,}721 \text{ people}} = .025 = 2.5\%$ birth rate

3. Finding Population Growth Rate (r):

$$\frac{\text{births} - \text{death}}{\text{total population}} = r \qquad$$ NOTE: this does not include immigration or emigration

for example: $\dfrac{20{,}000 \text{births} - 15{,}000 \text{ deaths}}{500{,}000 \text{ people}} = .01 \ (\text{x } 100) = 1.0\%$

4. Finding the Doubling Time of a Population:
   THE RULE OF 70!!!

$$\frac{70\%}{r \text{ (in percent form)}} \quad \text{or} \quad \frac{.7}{r \text{ (in decimal form)}} = \text{doubling time (years)}$$

for example: $\dfrac{.7}{.07} = 10$ years

Population Problems
Ms. Lolich/APES

Given the following information, calculate the problems below. <u>Show all your work for full credit</u> on each mathematical calculation. **Put final figures in the box.** Sentence answers can be written below the question.

Lolichkia is a newly formed volcanic island of 5000 square miles that is now part of the Canary Islands. In the year 2000, there are currently 250,000 inhabitants of the island. Last year, there were 12,000 new children born (all cute and very smart) and 10,000 people were recorded as deceased (mostly drunkards and hooligans).

1. What is the current population density?

> Density =

What do you expect will happen to the density as time goes on?

2. What are the birth and death rates?

> Birth rate =

> Death rate =

3. What **stage** in the demographic transition model do the birth and death rates suggest for this society? *Refer to your text for reference.*

4. What is the population growth rate (r)?

5. How many years will it take the population of Lolichkia double?

6. When would the population double if a fun ruling queen allowed an additional 50,000 immigrants (*all APES students of the U.S.*) to enter in one calendar year?