Name:_____ Integrated Alg. /Geometry 1

Check Your Understanding Pg. 301

In solving change-over-time problems in Unit 1, you discovered that the world population and population of individual countries grow in much same pattern as money earning interest in a bank. For example, you used data like the following to predict growth in two countries.

- **Brazil is the most populous country in South America. In 2005, its population was about 186 million. It was growing at a rate of about 1.1% per year.**
- **Nigeria is the most populous country in Africa. Its 2005 population was about 129 million. It was growing at a rate of 2.4% per year.**

a. Assuming that these growth rates continue, write function rules to predict the populations of the countries for any number of x years in the future.

Brazil: y= 186(1.011^x)

Nigeria: y= 129(1.024^x)

b. Compare the patterns of growth expected in each country for the next 20 years. Use tables and graphs of (year since 2005, population) values to illustrate the similarities and differences you notice.

Brazil is higher than Nigeria at first and then crosses Nigeria a little past the Y axis. Both have a slow incline at first and then a sudden, rapid incline.

c. Write and solve equations that give estimates when:

i. Brazil's population might reach 300 million.

Equation: 300=186(1.011^x)

Solution: x more than or equal to 44 300=186(1.011^44)

ii. Nigeria's population might reach 200 million.

Equation: 200=129(1.024^x)

Solution: X more than or equal to 19 200=129(1.024^x)

d. Assuming these growth patterns continue, estimate when the population of Nigeria will be greater than the population of Brazil.

The 29th Year - 2034