PRACTICE PROBLEMS ON POPULATION GROWTH

1. Use the graph of the idealized exponential and logistic growth curves to complete the following.



a.

d.

c.

b.

1. Label the axes and curves on the graph.
2. Give the formulas that describe both curves 1 and 2.
3. What does the straight line in the middle of the graph represent?
4. For each curve, indicate and explain where population growth is the most rapid
5. Which of these curves best represents human population growth?
6. If per capita birth rate is the number of organisms born per unit time by an average member of the population, what is the per capita birth rate in a population that has 34 births per 1,000 individuals?
7. If the per capita birth rate in a population is 0.05, how many organisms are added to this population in a year, if the population has 500 individuals at the beginning of the year and the carrying capacity has not been reached yet?
8. In 2006, the United States had a population of about 300 million people. If there were 14 births and 8 deaths per 1,000 people, what was the country’s net population growth that year (ignoring immigration and emigration, which are substantial)? Do you think the United States is currently experiencing exponential population growth? Explain.
9. The size of a hypothetical population is 25 organisms. Its maximum rate of increase is 1. The carrying capacity of the environment is 1,500 organisms for this species. What is the growth rate of this population (dN/dt)? What type of growth model does this population likely follow the next year?
10. The same population as in question 5, increased and reached 1,500 organisms. The intrinsic rate (rmax) of increase is still 1. What is the growth rate of the population in this case? What type of growth model does this population follow next year?