**Population Growth Equations Practice**

Formulas:

**Rate Population Growth Exponential Growth Logistic Growth**

dY/dt dN/dt = B – D  

dY = amount of change B = birth rate D = death rate N = population size

K = carrying capacity rmax = maximum per capita growth rate of population

Notes

 =  =  = **population growth rate**

Example 1:

There are 300 falcons living in a certain forest at the beginning of 2013. Suppose that every year there are 50 falcons born and 30 falcons that die.

a. What is the **population growth rate** (include units)? Interpret the value.

b. What is the **per capita growth rate** of the falcons over a year? Interpret the value.



c. Fill in the table and the construct a graph.

|  |  |
| --- | --- |
| Year | Population |
| 2013 |  |
| 2014 |  |
| 2015 |  |
| 2016 |  |
| 2017 |  |
| 2018 |  |

d. Find the **average rate of change** for the falcon population from 2013 to 2018 (include units). Interpret the value.

Example 2:

Kentwood, Michigan had a population of 49,000 in the year 2013. The infrastructure of the city allows for a carrying capacity of 60,000 people. rmax = .9 for Kentwood.

a. Is the current population above or below the carrying capacity? Will the population increase or decrease in the next year?

b. What will be the **population growth rate** for 2013 (include units)?

c. What will be the **population size** at the start of 2014.



d. Fill in the following table. Then graph year vs. population size.

|  |  |  |
| --- | --- | --- |
| Year | Population size | Population growth rate |
| 2013 |  |  |
| 2014 |  |  |
| 2015 |  |  |
| 2016 |  |  |
| 2017 |  |  |

e. What happened to the population size over the years? What happened to the population growth rate over the years?

f. Explain your answer from part (e) using what you know about carrying capacity.

g. Explain your answer from part (e) using the formula: 