Appendix D

The Environment

Environmental and wildlife preservation ensures future generations will have available resources and can enjoy the beauty of Earth. On the other hand, some of the damage humans have already done to the environment is expensive and time consuming to eradicate.

Application Practice

Answer the following questions. Use Equation Editor to write mathematical expressions and equations. First, save this file to your hard drive by selecting **Save As** from the File menu. Click the white space below each question to maintain proper formatting.

1. The cost, in millions of dollars, to remove *x* % of pollution in a lake modeled by $C = \frac{6{,}000}{200 - 2x}$

    a. What is the cost to remove 75% of the pollutant?

    b. What is the cost to remove 90% of the pollutant?

    c. What is the cost to remove 99% of the pollutant?

    d. For what value is this equation undefined?

    e. Do the answers to sections a. through d. match your expectations? Explain why or why not.

    Busch Enteratinment Corporation. (N.D.). Flamingos. Retrieved from http://www.seaworld.org/animal-info/info-books/flamingo/physical-characteristics.htm

2. Biologists want to set up a station to test alligators in the lake for West Nile Virus. Suppose that the costs for such a station are $2,500 for setup costs and $3.00 to administer each test.

    a. Write an expression that gives the total cost to test *x* animals.

    b. You can find the average cost per animal by dividing total costs by number of animals. Write the expression that gives the average cost per animal.

    c. Find the average cost per animal for 10 animals, 100 animals, and 1,000 animals.

    d. As the number of animals tested increases, what happens to the average cost to test the animals? Would the average cost ever fall below $3.00? If so, identify a value that supports your answer. If not, explain how you know.

    e. How many animals should be tested for the average cost to be $5.00 per animal?

3. To estimate animal populations, biologists count the total number of animals in a small section of a habitat. The total population of animals is directly proportional to the size of the habitat (in acres) polled.

a. Write an equation using only one variable that could be used to solve for the constant of variation k.

b. A biologist counted 12 white tail deer in a 100-acre parcel of land in a nature preserve. Find the constant of variation k.

c. If the entire nature preserve is 2,500 acres, then what is the total white tail deer population in the preserve? Describe how you arrived at your answer.