Name _____ Class _____ Date _____

8-1 • Guided Problem Solving

GPS Student Page 436, Exercise 43

Oceanography The function $y = 20 \cdot 0.975^x$ models the intensity of sunlight beneath the surface of the ocean. The output y represents the percent of surface sunlight intensity that reaches a depth of x feet. The model is accurate from about 20 feet to about 600 feet beneath the surface.

a. Find the percent of sunlight 50 feet beneath the surface of the ocean.
b. Find the percent of sunlight at a depth of 370 ft.

Read and Understand

1. What does the given function model? _____

2. What does the input x represent? _____

3. What does the input y represent? _____

Plan and Solve

4. Consider finding the percent of sunlight 50 feet beneath the surface of the ocean. What is the depth x? _____

5. Use a calculator to evaluate the function at this value. What is the function output? _____

6. Interpret the output as percent sunlight. What is the percent of sunlight 50 feet beneath the surface of the ocean? _____

7. Now consider finding the percent of sunlight at a depth of 370 ft. What is the depth x in this case? _____

8. Use a calculator to evaluate the function at this value. What is the function output? _____

9. Interpret the result. What is the percent of sunlight at a depth of 370 ft? _____

Look Back and Check

10. Which depth has more sunlight? Does this agree with your common sense? Check the reasonableness of your answer by using a graphing calculator to graph the function and verify the percent sunlight at each depth. _____

Solve Another Problem

11. The function $y = 62 \cdot 1.04^x$ models the quiz score of an average student in an algebra class. The output y represents the percent scored correct on the weekly quiz after spending x hours on homework that week. The model is accurate from about 2 hours to about 12 hours. Find the score of an average student that spends 10 hours per week studying algebra. _____