Name

7-3A Lesson Master

USES Objective E

1. In 2006, a particular car cost $21,725. Suppose its value depreciates 8% each year.

   a. What will the value of the car be in 2007?

   b. Write a formula that gives the value of the car $t$ years from when it was purchased.

   c. How much will the 2006 car be worth in 2012?

   d. In what year will the 2006 car be worth less than $10,000?

2. Multiple Choice. Which equation represents a starting amount depreciating at a rate of 13% each year?

   A $y = b(1.13)^t$  B $y = b(0.13)^t$  C $y = b(0.87)^t$  D $y = b(1.87)^t$

3. Write an equation in the form $y = b \cdot g^x$ to describe the numbers in the calculator display at the right.

   \[
   \begin{array}{|c|c|c|}
   \hline
   \text{Day} & \text{Increase by 30} & \text{Increase by 20\%} \\
   \hline
   0 & 100 & 100 \\
   1 & & \\
   2 & & \\
   3 & & \\
   4 & & \\
   5 & & \\
   6 & & \\
   7 & & \\
   8 & & \\
   9 & & \\
   10 & & \\
   \hline
   \end{array}
   \]

REPRESENTATIONS Objectives G and H

4. A biologist is studying how a new medicine affects the number of antibodies a patient has to fight disease. The number may grow at a constant rate or exponentially. The biologist looks at how 100 antibodies might increase in two cases.

   Case 1: There are 30 more each day.

   Case 2: There are 20% more each day.

   Let $x$ = the number of days.

   a. Write an expression for the number of antibodies if there are 30 added each day.

   b. Write an expression for the number of antibodies if they are increasing exponentially by 20% each day.

   c. Fill in the chart above. Round to the nearest integer.

   d. Which case gives more antibodies after 4 days?

   e. Which gives more antibodies after 10 days?