

Practice 17

FOR USE WITH SECTION 3.4

Suppose a bank offers interest compounded continuously. Use the formula $A = Pe^{rt}$ to find the value of \$2000 after 12 years at each interest rate.

1. 4.5% 2. 3.25% 3. 8% 4. 10.75%

Find the value of $\left(1 + \frac{1}{n}\right)^n$ for each value of n . Round each answer to six decimal places.

5. 2 6. 20 7. 20^2 8. 20^3

For each equation in Exercises 9–11, find an equivalent equation of the form $y = ab^t$.

9. $y = e^{0.05t}$ 10. $y = 25.4\left(\frac{1}{2}\right)^{t/250}$ 11. $y = 150e^{-0.16t}$

12. 100 mg of Neptunium-236 decays radioactively according to the equation $y = 100e^{-0.0308x}$ where x is in hours.

- Use a graphing calculator to graph this function. Sketch the graph.
- Estimate how many hours it takes for an amount of Neptunium-236 to be reduced by half.

13. The logistic function

$$y = \frac{12.2}{1 + 65e^{-0.435x}} + 14.7$$

gives an approximate model for the average fuel efficiency (in mi/gal) of cars produced in the U.S. between 1970 and 1993, where x = number of years after 1970.

- Use a graphing calculator to graph the function. Sketch the graph.
- Use the function to find the average fuel efficiency of cars produced in the U.S. in 1980 and 1985.