

1. **SNOWMOBILE** The value of a snowmobile has been decreasing by 7% each year since it was new. After 3 years, the value is \$3000. Find the original cost of the snowmobile.
 $3000 = a(1 - .07)^3$
 $3000 = a \cdot .804$
 $a = \$3731.34$

2. **BIKE COSTS** You buy a new mountain bike for \$200. The value of the bike decreases by 25% each year.
 a. Write a model giving the mountain bike's value y (in dollars) after t years. Use the model to estimate the value of the bike after 3 years.
 b. **REWRITE LOG**
 c. Estimate when the value of the bike will be \$100.
 1. $100 = 200(1 - .25)^t$ 4. rewrite log 6. $\frac{\log .5}{\log .75}$ change of base
 2. $.5 = .75^t$ 5. $\log .5 = t \log .75$
 3. solve for t $t = 2.4$ yrs

3. **FINANCE** You deposit \$800 in an account that pays 2.5% annual interest. Find the balance after 1 year if the interest is compounded with the given frequency.
 a. Quarterly
 b. Daily

4. **CAMERA PHONES** The number of camera phones shipped globally can be modeled by the function $y = 1.28e^{.131x}$ where x is the number of years since 1997 and y is the number of camera phones shipped (in millions). How many camera phones were shipped in 2007?
Home Tutor for problem solving help at classzone.com $y = 1.28e^{(1.31x)}$


5. **BIOLOGY** Scientists used traps to study the Formosan subterranean termite population in New Orleans. The mean number y of termites collected annually can be modeled by $y = 726e^{-.05x}$ where x is the number of years since 1989. What was the mean number of termites collected in 1995?
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6. **FINANCE** You deposit \$2000 in an account that pays 4% annual interest compounded continuously. What is the balance after 5 years?

7. **FINANCE** You deposit \$800 in an account that pays 2.65% annual interest compounded continuously. What is the balance after 12.5 years?

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EXAMPLE 4 Solve a multi-step problem

9. **BIOLOGY** The length l (in centimeters) of a tiger shark can be modeled by the function $l = 3.87 \cdot 27.6e^{-.17t}$ where t is the shark's age (in years).
 • Use the graph to estimate the length of a tiger shark that is 3 years old.


10. **EXAMPLE 4 Evaluate a logarithmic model**
THINKING The wind speed s (in miles per hour) near the center of a tornado can be modeled by $s = 59 \log d + 40$ where d is the distance (in miles) that the tornado travels. In 1925, a tornado traveled 220 miles through three states. Estimate the wind speed near the tornado's center.


11. **COMPOUND INTEREST** You deposit \$100 in an account that pays 6% annual interest. How long will it take for the balance to reach \$1000 for each frequency?
 a. Annually b. Quarterly
 $1000 = 100(1 + \frac{.06}{4})^{4t}$

12. **RADIOACTIVE DECAY** One hundred grams of radium are stored in a container. The amount R (in grams) of radium present after t years can be modeled by $R = 100e^{-.00042t}$. After how many years will only 5 grams of radium be present?

13. **MULTIPLE CHOICE** You deposit \$800 in an account that pays 2.25% annual interest compounded continuously. About how long will it take for the balance to triple?
 (A) 24 years (B) 36 years
 (C) 48.8 years (D) 52.6 years

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