

4.7: Chapter Review

1. The value of a new boat depreciates after it is purchased. The value of the boat 7 years after it was purchased is \$25,000 and its value has been decreasing at the rate of 8.2% per year.
 - a. Find the initial value of the boat when it was purchased.
 - b. How many years after it was purchased will the boat's value be \$20,000?
 - c. What was its value 3 years after the boat was purchased?
2. Tony invested \$40,000 in 2010; unfortunately his investment has been losing value at the rate of 2.7% per year.
 - a. Write the function that gives the value of the investment as a function of time t in years after 2010.
 - b. Find the value of the investment in 2020, if its value continues to decrease at this rate.
 - c. In what year will the investment be worth half its original value?
3. Rosa invested \$25,000 in 2005; its value has been increasing at the rate of 6.4% annually.
 - a. Write the function that gives the value of the investment as a function of time t in years after 2005.
 - b. Find the value of the investment in 2025.
4. The population of a city is increasing at the rate of 3.2% per year, since the year 2000. Its population in 2015 was 235,000 people.
 - a. Find the population of the city in the year 2000.
 - b. In what year will the population be 250,000 if it continues to grow at this rate.
 - c. What was the population of this city in the year 2008?
5. The population of an endangered species has only 5000 animals now. Its population has been decreasing at the rate of 12% per year.
 - a. If the population continues to decrease at this rate, how many animals will be in this population 4 years from now.
 - b. In what year will there be only 2000 animals remaining in this population?
6. 300 mg of a medication is administered to a patient. After 5 hours, only 80 mg remains in the bloodstream.
 - a. Using an exponential decay model, find the hourly decay rate.
 - b. How many hours after the 300 mg dose of medication was administered was there 125 mg in the bloodstream
 - c. How much medication remains in the bloodstream after 8 hours?
7. If $y = 240b^t$ and $y = 600$ when $t = 6$ years, find the annual growth rate. State your answer as a percent.
8. If the function is given in the form $y = ae^{kt}$, rewrite it in the form $y = ab^t$.
If the function is given in the form $y = ab^t$, rewrite it in the form $y = ae^{kt}$.
 - a. $y = 375000(1.125^t)$
 - b. $y = 5400e^{0.127t}$
 - c. $y = 230e^{-0.62t}$
 - d. $y = 3600(0.42^t)$

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