

Name: _____

Date: _____

UNIT 4 • MODELING AND ANALYZING EXPONENTIAL FUNCTIONS

Lesson 1: Creating Exponential Equations

Practice 4.1.1: Creating Exponential Equations in One Variable

B

Use what you know about linear and exponential equations to complete problems 1–3.

1. Determine whether each scenario can be modeled by a linear or an exponential equation.
 - a. The price of a gallon of gas increases by \$0.75 every 2 months.

 - b. Every 2 months, a gallon of gas costs three times as much as it did before.

2. Determine whether each scenario can be modeled by a linear or an exponential equation.
 - a. A piece of jewelry appreciates (increases in value) so that after 20 years it's worth twice what you paid for it.

 - b. A piece of jewelry appreciates so that its value doubles every 20 years.

3. Determine whether each scenario can be modeled by a linear or an exponential equation.
 - a. A town's population declines by 3% each year.

 - b. About 200 residents leave town each year.

continued

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For problems 4–10, write an equation to model each scenario. Then use the equation to solve the problem.

4. If you end with 1,920 bacteria in a Petri dish and the population doubled every hour, how many bacteria did you start with 6 hours ago?
5. An investment doubles in value every 9 years. What was the starting value of the investment if it is worth \$4,800 after 27 years?
6. An insect population triples every 4 months. If the population started out with 24 insects, how many insects would there be in 16 months?
7. The half-life of a radioactive substance is the time it takes for half of the substance to decay. The half-life of one form of rhodium, Rh-106, is about 30 seconds. If you start with 100 grams of Rh-106, how much will be left after 4 minutes?
8. The NCAA Division I Basketball tournament begins each year with a certain number of teams. After each round of games, the losing teams are cut from the tournament, so that each round has half as many teams playing as the previous round. After 3 rounds 8 teams are left. How many teams started out in the tournament?
9. A city's population grows by about 1% each year. If the city's population is 63,000 people now, what will the population be in 4 years?
10. A town's population decreases each year by about 1%. If the town's population is 3,000 now, what will the population be in 5 years? In 10 years?