



# Precalculus: Exponential Function

Name \_\_\_\_\_ Date \_\_\_\_\_

## Finding Equations of Exponential Functions

- (1) A radioactive substance decays exponentially. A scientist begins with 611 mg of a radioactive substance. After 38 hours, 222 mg of the substance remains. How many mg will remain after 46 hours?
  
- (2) An investment was valued at \$24,000 in the year 1992. The value appreciated to \$35,430 by the year 2000. What was the annual growth rate between 1992 and 2000? Assume that the value continues to grow by the same percentage. What did the value equal in the year 2004?
  
- (3) Find a formula for an exponential function  $y=f(x)$  passing through the two points A and B and find the drop rate where  $A = (5,78)$ ,  $B = (2,96)$ .
  
- (4) A car was valued at \$36,000 in the year 1993. The value depreciated to \$21,208 by the year 2001. Assume that the car value continues to drop by the same percentage. What was the value in the year 2012?
  
- (5) A car was valued at \$30,000 in the year 1995. The value depreciated to \$24,299 by the year 2003. Assume that the car value continues to drop by the same percentage. What was the value in the year 2008?
  
- (6) A radioactive substance decays exponentially. A scientist begins with 688 mg of a radioactive substance. After 15 hours, 152 mg of the substance remains. How many mg will remain after 37 hours?
  
- (7) A car was valued at \$33,000 in the year 1994. The value depreciated to \$29,226 by the year 1999. Assume that the car value continues to drop by the same percentage. What was the value in the year 2007?



## Answers

### Finding Equations of Exponential Functions

(1) A radioactive substance decays exponentially. A scientist begins with 611 mg of a radioactive substance. After 38 hours, 222 mg of the substance remains. How many mg will remain after 46 hours?

179.39 mg

(2) An investment was valued at \$24,000 in the year 1992. The value appreciated to \$35,430 by the year 2000. What was the annual growth rate between 1992 and 2000? Assume that the value continues to grow by the same percentage. What did the value equal in the year 2004?

4.99 %. \$43,048

(3) Find a formula for an exponential function  $y=f(x)$  passing through the two points A and B and find the drop rate where A = (5,78), B = (2,96).

$y = 110,2526 \cdot (0,9331)^x$ . drop rate = 6.69 %

(4) A car was valued at \$36,000 in the year 1993. The value depreciated to \$21,208 by the year 2001. Assume that the car value continues to drop by the same percentage. What was the value in the year 2012?

\$10,246

(5) A car was valued at \$30,000 in the year 1995. The value depreciated to \$24,299 by the year 2003. Assume that the car value continues to drop by the same percentage. What was the value in the year 2008?

\$21,300

(6) A radioactive substance decays exponentially. A scientist begins with 688 mg of a radioactive substance. After 15 hours, 152 mg of the substance remains. How many mg will remain after 37 hours?

16.60 mg

(7) A car was valued at \$33,000 in the year 1994. The value depreciated to \$29,226 by the year 1999. Assume that the car value continues to drop by the same percentage. What was the value in the year 2007?

\$24,064