



Precalculus: Exponential Function

Name _____ Date _____

Finding Equations of Exponential Functions

- (1) A radioactive substance decays exponentially. A scientist begins with 825 mg of a radioactive substance. After 33 hours, 401 mg of the substance remains. How many mg will remain after 58 hours?

- (2) An investment was valued at \$27,000 in the year 1994. The value appreciated to \$39,480 by the year 2005. What was the annual growth rate between 1994 and 2005? Assume that the value continues to grow by the same percentage. What did the value equal in the year 2009?

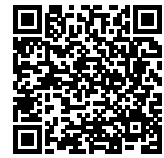
- (3) A radioactive substance decays exponentially. A scientist begins with 853 mg of a radioactive substance. After 19 hours, 367 mg of the substance remains. How many mg will remain after 54 hours?

- (4) Find a formula for an exponential function $y=f(x)$ passing through the two points A and B and find the grow rate where $A = (4,49)$, $B = (5,88)$.

- (5) Find a formula for an exponential function $y=f(x)$ passing through the two points A and B and find the grow rate where $A = (-1,18)$, $B = (5,42)$.

- (6) A car was valued at \$41,000 in the year 1988. The value depreciated to \$31,299 by the year 1994. Assume that the car value continues to drop by the same percentage. What was the value in the year 2019?

- (7) A car was valued at \$40,000 in the year 1991. The value depreciated to \$31,115 by the year 1997. Assume that the car value continues to drop by the same percentage. What was the value in the year 2015?



Answers

Finding Equations of Exponential Functions

(1) A radioactive substance decays exponentially. A scientist begins with 825 mg of a radioactive substance. After 33 hours, 401 mg of the substance remains. How many mg will remain after 58 hours?

232.16 mg

(2) An investment was valued at \$27,000 in the year 1994. The value appreciated to \$39,480 by the year 2005. What was the annual growth rate between 1994 and 2005? Assume that the value continues to grow by the same percentage. What did the value equal in the year 2009?

3.51%. \$45,330

(3) A radioactive substance decays exponentially. A scientist begins with 853 mg of a radioactive substance. After 19 hours, 367 mg of the substance remains. How many mg will remain after 54 hours?

77.61 mg

(4) Find a formula for an exponential function $y=f(x)$ passing through the two points A and B and find the grow rate where A = (4,49), B = (5,88).

$y = 4.7103 \cdot (1.7959)^x$. grow rate = 79.59%

(5) Find a formula for an exponential function $y=f(x)$ passing through the two points A and B and find the grow rate where A = (-1,18), B = (5,42).

$y = 20.7301 \cdot (1.1517)^x$. grow rate = 15.17%

(6) A car was valued at \$41,000 in the year 1988. The value depreciated to \$31,299 by the year 1994. Assume that the car value continues to drop by the same percentage. What was the value in the year 2019?

\$10,162

(7) A car was valued at \$40,000 in the year 1991. The value depreciated to \$31,115 by the year 1997. Assume that the car value continues to drop by the same percentage. What was the value in the year 2015?

\$14,646