



Date \_\_\_\_\_

## **Precalculus: Exponential Function**

Finding Equations of Exponential Functions
(1) A car was valued at \$44,000 in the year 1982. The value depreciated to \$29,686 by the year 1990. Assume that the car value continues to drop by the same percentage. What was the value in the year 1997?
(2) A radioactive substance decays exponentially. A scientist begins with 659 mg of a radioactive substance. After 44 hours, 428 mg of the substance remains. How many mg will remain after 84 hours?
(3) A car was valued at \$26,000 in the year 1980. The value depreciated to \$16,181 by the year 1986. Assume that the car value continues to drop by the same percentage. What was the value in the year 1989?
(4) A car was valued at \$21,000 in the year 1985. The value depreciated to \$14,133 by the year 1992. Assume that the car value continues to drop by the same percentage. What was the value in the year 2007?
(5) A radioactive substance decays exponentially. A scientist begins with 801 mg of a radioactive substance. After 16 hours, 378 mg of the substance remains. How many mg will remain after 72 hours?
(6) A car was valued at \$26,000 in the year 1990. The value depreciated to \$13,696 by the year 1998. Assume that the car value continues to drop by the same percentage. What was the value in the year 2008?
(7) Find a formula for an exponential function $y=f(x)$ passing through the two points A and B and find the grow rate where $A=(-4,73)$ , $B=(-2,97)$ .





## **Answers**

Finding Equations of Exponential Functions

(1) A car was valued at \$44,000 in the year 1982. The value depreciated to \$29,686 by the year 1990. Assume that the car value continues to drop by the same percentage. What was the value in the year 1997?

\$21,038

- (2) A radioactive substance decays exponentially. A scientist begins with 659 mg of a radioactive substance. After 44 hours, 428 mg of the substance remains. How many mg will remain after 84 hours? 289.10 mg
- (3) A car was valued at \$26,000 in the year 1980. The value depreciated to \$16,181 by the year 1986. Assume that the car value continues to drop by the same percentage. What was the value in the year 1989?

\$12,765

(4) A car was valued at \$21,000 in the year 1985. The value depreciated to \$14,133 by the year 1992. Assume that the car value continues to drop by the same percentage. What was the value in the year 2007?

\$6,049

- (5) A radioactive substance decays exponentially. A scientist begins with 801 mg of a radioactive substance. After 16 hours, 378 mg of the substance remains. How many mg will remain after 72 hours? 27.29 mg
- (6) A car was valued at \$26,000 in the year 1990. The value depreciated to \$13,696 by the year 1998. Assume that the car value continues to drop by the same percentage. What was the value in the year 2008?

\$6,146

(7) 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=(-4,73), B=(-2,97).

 $y = 128.8904 \cdot (1.1527)^x$ . grow rate = 15.27%