

NAME _____

DATE _____

PER. _____

EXPONENTIAL GROWTH & DECAY – Day 2

Classify each as exponential growth or decay, write a function, answer the question.
Round answers to the nearest whole number.

1. The population of College Station has been increasing at an average annual rate of 1.2%. The population in 2013 was 100,050 people. Predict the population in 2023.

Growth / Decay Function: _____

Answer: _____

2. You buy a new car for \$33,560. The average new car depreciates in value by about 18% each year. Approximately how much will your car be worth in 5 years?

Growth / Decay Function: _____

Answer: _____

3. The “Mendelssohn” Stradivarius violin was estimated to be worth approximately \$1.7 million in 1990. The violin is expected to increase in value by approximately 7.5% each year. Estimate the value of the violin in the year 2010.

Growth / Decay Function: _____

Answer: _____

4. A type of bacteria has a very high exponential growth rate at 80% *every hour*. If the sample begins with 10 bacteria, how many bacteria are there after 5 hours? 1 day?

Growth / Decay Function: _____

Answer: _____, _____

5. Carl Gossell is a machinist. He bought some new machinery for \$125,000. He wants to calculate the value of the machinery over the next 10 years for tax purposes. If the machinery depreciates at 15% per year, what is the value of the machinery at the end of 10 years?

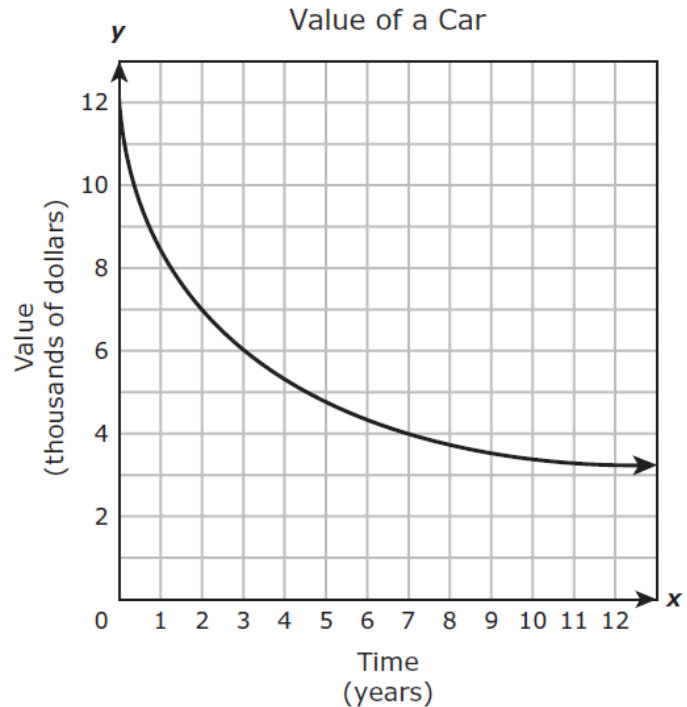
Growth / Decay Function: _____

Answer: _____

Answer the following.

6. The graph below shows the change in the value of a car over several years.

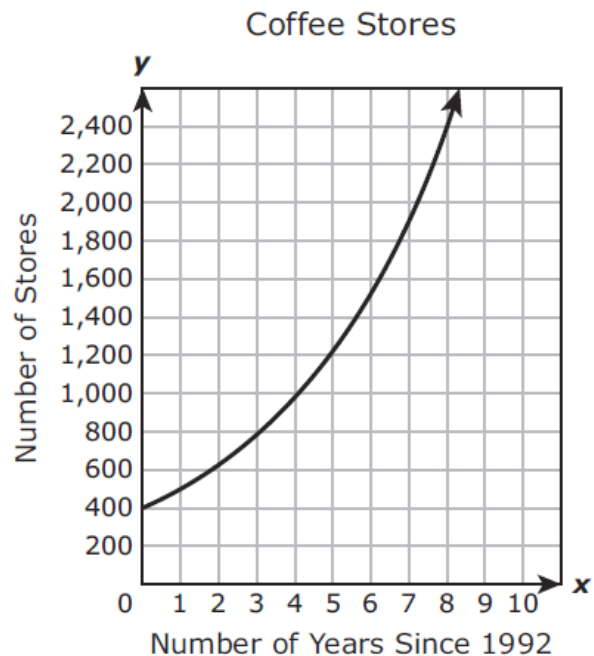
- A) What was the initial value of the car?
- B) How much is the car worth after 3 years?
- C) When will the car have a value of approximately \$3500?
- D) Between which two years did the car lose the most value?



7. The number of stores opened by a coffee company can be modeled by the exponential function graphed on the grid, where x is the number of years since 1992.

Based on the graph, which statement does **not** appear to be true?

- A. The coffee company had opened 400 stores by the end of 1992.
- B. The coffee company opened 100 stores in one year.
- C. By the end of 1995, the company had opened just under 800 stores.
- D. Since 1992 the coffee company has opened 250 stores each year.



8. Which of the following functions is a model of exponential growth?

- A. $y = (1 - 0.3)^x$
- B. $y = \frac{1}{2}(0.25)^x$
- C. $y = \left(\frac{1}{2}\right)^x$
- D. $y = \frac{1}{2}(1.004)^x$