

1.) An equation to represent the value of a car after  $t$  **months** of ownership is  $v = 32,000(0.81)^{\frac{t}{12}}$ .

Which statement is **not** correct?

- (A) The car lost approximately 19% of its value each month.
- (B) The car maintained approximately 98% of its value each month.
- (C) The value of the car when it was purchased was \$32,000.
- (D) The value of the car 1 year after it was purchased was \$25,920.

2.) The function  $M(t)$  represents the mass of radium over time,  $t$ , in years.

$$M(t) = 100e^{\frac{-0.69t}{1590}}$$

Determine if the function  $M(t)$  represents growth or decay. **Explain your reasoning.**

3.) A student studying public policy created a model for the population of Detroit, where the population decreased 25% over a decade. He used the model  $P = 714(0.75)^d$ , where  $P$  is the population, in thousands,  $d$  **decades** after 2010. Another student, Suzanne, wants to use a model that would predict the population after  $y$  **years**. Suzanne's model is best represented by

(A)  $P = 714(0.6500)^y$                       (C)  $P = 714(0.9716)^y$

(B)  $P = 714(0.8500)^y$                       (D)  $P = 714(0.9750)^y$

4.) The function  $N(t) = 100e^{-0.023t}$  models the number of grams in a sample of cesium-137 that remain after  $t$  years. On which interval is the sample's **average rate** of decay the **fastest**?

(A) [1, 10]                      (B) [10, 20]                      (C) [15, 25]                      (D) [1, 30]