

## *Modeling Exponential Functions with Inequalities*

1. Tage deposits \$2500 into an account that earns 2.7% interest compounded continuously. Which inequality can be used to determine how long it will take for his account to have at least \$4000?

- 1)  $2500(1.027)^t \leq 4000$
- 2)  $2500(1.027)^t \geq 4000$
- 3)  $2500e^{.027t} \leq 4000$
- 4)  $2500e^{.027t} \geq 4000$

2. Lamar has 2000 ants in an ant colony and the population is doubling every 4 days. His tank can hold a maximum amount of 325000 ants. Which inequality can be used to determine how many days,  $d$ , can pass before he will need to buy a bigger tank?

- 1)  $2000(2)^{\frac{d}{4}} \leq 325000$
- 2)  $2000(2)^{\frac{d}{4}} \geq 325000$
- 3)  $2000(4)^{\frac{d}{2}} \leq 325000$
- 4)  $2000(4)^{\frac{d}{2}} \geq 325000$

3. Caleb bought a car for \$19,100 and its value is decreasing by 12% each year. He wants to sell his car while its value is greater than \$5000. Which inequality can be used to find the maximum number of years,  $t$ , he can keep his car while its value is greater than \$5000?

- 1)  $19100(.12)^t \geq 5000$
- 2)  $19100(.12)^t \leq 5000$
- 3)  $19100(.88)^t \geq 5000$
- 4)  $19100(.88)^t \leq 5000$

4. A sample of 2000 grams of Fluorine-18 has a half life of 109.734 minutes. Which inequality can be used to represent how many minutes,  $m$ , can pass for there to be a minimum of 67 grams remaining?

- 1)  $2000\left(\frac{1}{2}\right)^{\frac{t}{109.734}} \geq 67$
- 2)  $2000\left(\frac{1}{2}\right)^{\frac{t}{109.734}} \leq 67$
- 3)  $2000(2)^{\frac{t}{109.734}} \geq 67$
- 4)  $2000(2)^{\frac{t}{109.734}} \leq 67$