



DATE: _____

1. Write the differential equation that models the following statement:
The rate of change of Q with respect to t is inversely proportional to the square of t .

2. The rate of change of V is proportional to V . When $t = 0$, $V = 20,000$ and when $t = 4$, $V = 12,500$. What is the value of V when $t = 6$?

3. The rate of change of the number of coyotes $N(t)$ in a population is directly proportional to $650 - N(t)$, where t is the time in years. When $t = 0$, the population is 300, and when $t = 2$, the population has increased to 500. Find the population when $t = 3$.

 4. A calf that weighs 60 pounds at birth gains weight at the rate $\frac{dw}{dt} = 1200 - w$ where w is weight in pounds and t is time in years. If the animal is sold when its weight reaches 800 pounds, find the time of sale.

 5. A pizza, heated to a temperature of 350 degrees Fahrenheit ($^{\circ}\text{F}$), is taken out of an oven and placed in a 75°F room at time $t = 0$ minutes. The temperature of the pizza is changing at a rate of $-110e^{-0.4t}$ degrees Fahrenheit per minute. To the nearest degree, what is the temperature of the pizza at time $t = 5$ minutes?

- (A) 112°F (B) 119°F (C) 147°F (D) 238°F (E) 335°F