

## Formative Assessment #21 – Applications of Exponential and Logarithmic Functions

**RF6.4: I can solve application problems involving exponential growth and decay.**

1. The number of subscribers to a new magazine has increases by 5% each month. In the first month, the magazine has 2250 subscribers. If the growth continues at this rate, how many subscribers can the magazine expect to have after 2 years?
2. After school, you find 4.0 g of a radioactive substance in your glove compartment. Not knowing what to do with it, you decide to just leave it in the glove compartment... After 12 weeks, only 3.0 g of the substance remains. What is the period of the substance's half-life to the nearest tenth of a week?



**RF6.5: I can solve application problems that involve logarithmic equations.**

3. Paleontologists can estimate the size of a dinosaur from incomplete skeletal remains. For a carnivorous dinosaur, the relationship between the length,  $s$ , in meters of the skull and the body mass,  $m$ , in kilograms, can be expressed using the logarithmic equation  $3.6022 \log s = \log m - 3.4444$ . Determine the body mass, to the nearest tenth of a kilogram, of a dinosaur (named Fernando) with a skull length of 0.78 m.



**RF6.6: I can solve problems involving natural exponential equations and natural logarithmic function.**

4. Over the last ten years, the amount of money,  $M$  (in billions of dollars), spent in North America by car dealerships advertising their product can be modelled by the equation  $M(t) = 0.15e^{0.3t} + 0.78$ , where  $t = 0$  represents the year 2000. In what year was approximately 3 billion dollars spent by car dealerships on advertising?

