

1.) The function $p(t) = 110e^{0.03922t}$ models the population of a city, in millions, t years after 2010.

As of today, consider the following two statements:

I. The current population is 110 million. **False**

II. The population increases continuously by approximately 3.9% per year.

$$r = .03922$$

$$3.922\%$$

This model supports

- (A) I only **(B)** II only (C) both I and II (D) neither I or II

2.) According to a pricing website, Indroid phones lose 58% of their cash value over 1.5 years.

Which expression can be used to estimate the value of a \$300 Indroid phone in 1.5 years?

- (A)** $300e^{-0.87}$ (B) $300e^{-0.63}$ (C) $300e^{-0.58}$ (D) $300e^{-0.42}$

$$e^{-.87} \approx .42$$

$$e^{-.63} \approx .53$$

Decay $y = a(1-r)^t$

$$y = a(.42)^t$$

$$y = 300(.42)^t$$

3.) Camryn puts \$400 into a savings account that earns 6% annually. The amount in her account can be modeled by $C(t) = 400(1.06)^t$ where t is the time in years. Which expression best approximates the amount of money in her account using a weekly growth rate?

(a) $400(1.001153846)^t$

(c) $400(1.001153846)^{52t}$

(b) $400(1.001121184)^t$

(d) $400(1.001121184)^{52t}$

$$C(t) = 400 (1.06)^{\frac{52}{52} t}$$

$$C(t) = 400 \left(1.06^{\frac{1}{52}}\right)^{52t}$$

$$C(t) = 400 (1.001121184)^{52t}$$

4.) Last year, the total revenue (R) for Home Style, a national restaurant chain, increased 5.25% over the previous year (y). They used the model: $R = (1.0525)^y$.

If this trend were to continue, which expression could the company's chief financial officer use to approximate their **monthly** percent increase in revenue? [Let m represent **months**.]

(a) $R = (1.0525)^m$

(b) $R = (1.0525)^{\frac{12}{m}}$

(c) $R = (1.00427)^m$

(d) $R = (1.00427)^{\frac{m}{12}}$

$$R = (1.0525)^y$$

$$R = (1.0525)^{\frac{m}{12}}$$

$$R = \left(1.0525^{\frac{1}{12}}\right)^m$$

$$R = (1.00427)^m$$

replace y with $\frac{m}{12}$