

Name _____
Mr. Schlansky

Date _____
Algebra II



Converting Rates

Round all coefficients to 6 decimal places

1. Gerard took out a \$72000 loan for college that has a 12.7% interest rate. An equation to represent this situation is given as $A(t) = 72000(1.127)^t$.

Write an equation to find the monthly growth rate after t years.

Write an equation to find the monthly growth rate after m months.

Write an equation to find the weekly growth rate after t years.

Write an equation to find the weekly growth rate after w weeks.

2. The population of a small neighborhood in Brooklyn, NY is 452,000 and is growing by a rate of 11.6% each year. An equation to represent this situation is given as $A(t) = 452000(1.116)^t$.

Write an equation to find the monthly growth rate after t years.

Write an equation to find the monthly growth rate after m months.

Write an equation to find the weekly growth rate after t years.

Write an equation to find the weekly growth rate after w weeks.

14. Cameron's YouTube video currently has 1200 views and can be modeled by the expression $1200(1.102)^d$ where d represents days. Which expression represents the weekly rate after t weeks.

- 1) $1200(1.9737)^t$ 3) $1200(1.0140)^t$
 2) $1200(1.9737)^{\frac{t}{7}}$ 4) $1200(1.0140)^{\frac{t}{7}}$

15. The number of people who have read an article grows exponentially throughout the day and can be modeled by the function $N(t) = 2(1.0098)^t$, where t represents the number of minutes since the article has been posted. Which equation best represents the number of people who have read the article in terms of the growth rate per second?

- 1) $N(t) = 2(1.000163)^{\frac{t}{60}}$ 3) $N(t) = 2(1.79524)^{\frac{t}{60}}$
 2) $N(t) = 2(1.000163)^{60t}$ 4) $N(t) = 2(1.79524)^{60t}$

16. 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

- 1) $P = 714(0.6500)^y$ 3) $P = 714(0.9716)^y$
 2) $P = 714(0.8500)^y$ 4) $P = 714(0.9750)^y$

17. The black bear population for a certain area of the Adirondacks can be modeled by the equation $B = 5835.943(1.026)^t$, where t is measured in years since 2010. Kieran would like to rewrite this model in terms of a 5-year growth rate. Kieran's model is best represented by

- 1) $B = 5835.943(1.005147)^{\frac{t}{5}}$ 3) $B = 5835.943(1.136938)^{\frac{t}{5}}$
 2) $B = 5835.943(1.005147)^{5t}$ 4) $B = 5835.943(1.136938)^{5t}$

18. According to the USGS, an agency within the Department of Interior of the United States, the frog population in the U.S. is decreasing at the rate of 3.79% per year. A student created a model, $P = 12,150(0.962)^t$, to estimate the population in a pond after t years. The student then created a model that would predict the population after d decades. This model is best represented by

- 1) $P = 12,150(0.461)^d$ 3) $P = 12,150(0.996)^d$
 2) $P = 12,150(0.679)^d$ 4) $P = 12,150(0.998)^d$

19. Last year, the total revenue for Home Style, a national restaurant chain, increased according to the expression $(1.0525)^t$ where t represents the number of years. 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.]

- 1) $(1.0525)^m$ 3) $(1.00427)^m$
 2) $(1.0525)^{\frac{12}{m}}$ 4) $(1.00427)^{\frac{m}{12}}$