

Warm Up:

Fill in the fraction, decimal, percent conversion table below.

	Fraction	Decimal	Percent
1.	3/10		
2.		0.91	
3.			5%
4.			100%

KEY CONCEPT: Exponential Growth Functions

$$y = a(1 + r)^t$$

Example 1a: Exponential Growth

The gross domestic product (GDP) is a monetary value of all goods and services within a country in a specific time-period. The GDP per capita is the value divided by population. One model says that the GDP per capita in the United States was \$13,513 in 1946 and has increased by 2% every year.

Part A

Write an equation to represent GDP per capita after t years, where a represents the initial GDP in 1946, and r represents the rate of growth each year.

Part B

If this trend continued, calculate the GDP per capita in 2016.

How can I meet today's standards?

*I can **write equations for exponential functions**, given two points, a graph, or a table of values.*

Example 1b: Exponential Growth

An investment banker is claiming that he can guarantee a 6.5% annual return on all investment accounts with a minimum starting balance of \$100,000.

Part A

Write an equation to represent the estimated balance in the account after t years.

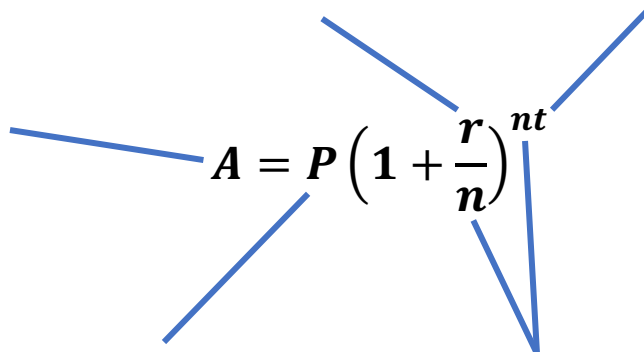
Part B

To the nearest dollar, predict the balance in the account after 20 years.

Part C

What assumption did you make when predicting the balance after 20 years?

KEY CONCEPT: Compound Interest

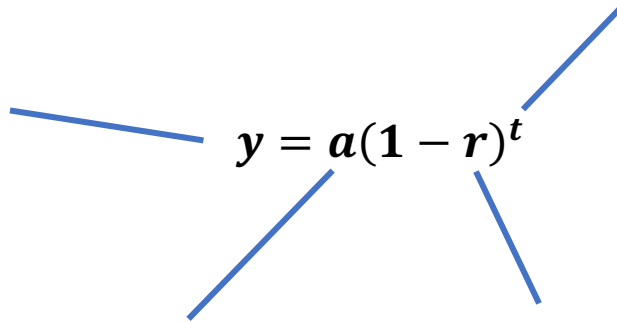

$$A = P \left(1 + \frac{r}{n} \right)^{nt}$$

Example 2: Compound Interest

A) Maria invests \$5500 into a college savings account that pays 3.25% compounded quarterly. How much money will there be in the account after 5 years?

B) Earl opens a certificate of deposit with \$1500 that pays 2.75% compounded daily. To the nearest cent, how much money will be in the account after 1 year?

KEY CONCEPT: Exponential Decay


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

Example 3: Exponential Decay

- In banking, a dormant account is one that has not been used in over a year. A bank charges a monthly fee on dormant accounts of 0.8% of the account balance. One dormant account initially had a balance of \$1,609.
 - a. Write an equation to represent the balance in the account after t months.
 - b. Estimate the balance in the account after a year.

- In a trading card game, a warrior with 100 life points finds himself stuck in harmful slime that is depleting his life points by 1% every minute.
 - A) Write an equation that represents the warrior's estimated life after t minutes.
 - B) To the nearest point, predict the warrior's life points after staying in the slime for 45 minutes.