

Who Wants to be a Millionaire?

Name: _____



One of the primary ways we use exponential growth is in talking about financial accounts. Today we'll explore how your money can make more money with interest!

1. You just earned a \$1000 bonus at your job. Would you rather receive all the money at the end of the year or half the money now and half the money later? Why?

2. Consider a magical bank that offers you 100% interest at the end of the year. If you put \$1000 into this account, how much would you have after one year?

3. Instead of being paid the 100% interest in one lump sum, let's consider what happens when we get interest paid out multiple times in the year in smaller increments. We'll explore interest that is earned quarterly.
 - a. Will the amount of interest earned be the same each quarter? How do you know?

 - b. Fill in the table to see how the money in the account is changing. Show your work.

Amount invested	% interest earned each quarter	Amount in account after 1 st quarter	Amount in account after 2 nd quarter	Amount in account after 3 rd quarter	Amount in account at end of year
\$1000					

4. How does the amount in the account after 1 year compare to your answer in question 2? Why do you think this happens?

5. Is it even better to earn interest monthly or weekly? What about daily? Fill out the table to explore these options.

Amount invested	Interest is earned...	Number of pay-outs per year	% interest earned each pay-period	Amount in account at end of year
\$1000	Monthly			
\$1000	Weekly			
\$1000	Daily			

6. a) Do you think you could triple your money if you received payments multiple times a day?

- b) What is the most money you could have in your account after one year with the same initial investment of \$1000?

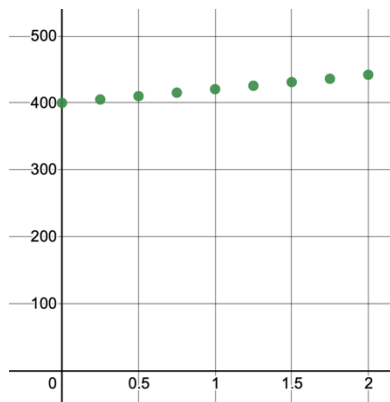
Section 3.3—Compound Interest and an Introduction to “e”

Important Ideas:

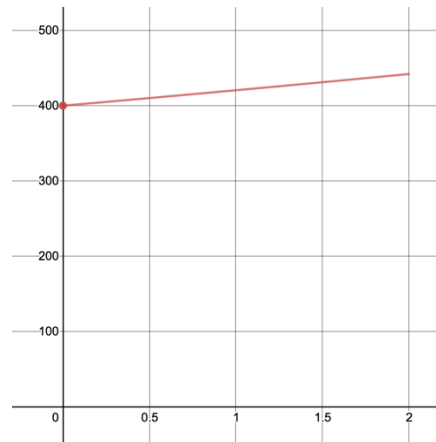
Check Your Understanding!

1. Each scenario represents \$400 invested at 5% interest over the course of 2 years. For each scenario, determine if interest was compounded annually, biannually, quarterly, monthly or continuously.

a)



b)



2. On the day of a child’s birth, a deposit of \$25,000 is made in a trust fund that pays 8.75% interest. Determine the balance in this account on the child’s 25th birthday if interest is compounded weekly, monthly, and continuously.
3. The number of bacteria in a certain population increases according to a *continuous exponential growth model* at a rate of 8.1% per hour. There are 1800 bacteria at $t = 0$.
 - a. Write an equation that gives the number of bacteria after t hours.
 - b. Find the number of bacteria in the population after 6 hours.