

PROBLEM SET – Exponential Functions from Two Points

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Class 821 and 829

Important Problems

The following problems test your ability to find the common ratio using your calculator

1. An online store has a constant *percent growth* of profits every week. In week 2, the store made a profit of \$6000. In week 5, the store made a profit of \$9000.
 - a. Use your calculator to find the common ratio (round to nearest hundredth):
 - b. Use your calculator to find term 0 (round to nearest cent):
 - c. Create a function, $f(x)$, that models the store's profits after x weeks
2. Sam put money into an investment account in the year 2000. In 2003, the account had \$1,200 and in 2006, the account had \$2,100.
 - a. Use your calculator to find the common ratio (round to nearest hundredth):
 - b. Find term 0 (round to nearest cent):
 - c. Create a function, $f(x)$, that models the account's value x years after 2000
 - d. State the percent *increase* every year in the account
3. Suppose you have \$475 invested in a bank (term 0). Your advisor tells you to expect your money to double in 12 years.
 - a. Use your calculator to find the common ratio (round to nearest hundredth):
 - b. Create a function, $f(x)$, that models the value in the account after x years
 - c. Use the function to predict how much money you'll have in the account after 24 years

The next problem models the Quarter 3 Project

1. In 2014, a Honda Civic LX cost about \$13,000. In 2018, the same car declined in value and could be resold for only \$9,000.
 - a. Use your calculator to find the common ratio (round to nearest hundredth):
 - b. Create a function, $f(x)$, that models the value of the car after x years since 2014
 - c. Use the function to predict how much the car will be worth in 2020.

The following problems should be solved without a calculator

1. An online store has a constant *percent growth* of sales every week. In week 2, the store sold 60 pairs of shoes. In week 4, the store sold 240 pairs of shoes
 - a. Find the common ratio without a calculator:
 - b. Find term 0 without a calculator:
 - c. Create a function, $f(x)$, that models the store's sales after x weeks
2. A bacterial population is rapidly dwindling. In March, the population of bacteria was 27,000 and in June, the population was 1,000.
 - a. Find the common ratio without a calculator
 - b. Find term 0 (with a calculator if needed)
 - c. Create a function, $f(x)$, that models the bacterial population after x months

These two problems are a review from yesterday

1. Krystal was given \$3000 when she was born. Her parents invested it at a 2% interest rate compounded annually. No deposits or withdrawals were made.
 - a. Create a function to determine how much Krystal had in the account when she turns x years old.
 - b. Use the expression to find out how much would be in the account at the end of 6 years
 - c. Suppose Krystal was given the \$3000 when she was 2 years old. Modify your expression in part *a* that can be used to determine how much Krystal had in the account when she turns x years old

2. Virus A has an infection rate of 11% per day as compared to Virus B, which has an infection rate of 4% per day. Suppose there were one case of Virus A and 30 cases of Virus B initially.
 - a. Create a function to determine the number of cases of Virus A after x days
 - b. Create a function to determine the number of cases of Virus B after x days
 - c. Use your calculator or guess and check to find how many days it takes until there are more cases of Virus A than cases of Virus B