

Using Functions in Models and Decision Making: Regression in Linear and Nonlinear Functions

V.A Student Activity Sheet 2: Comparing Linear and Exponential Functions

Coen sells magazine subscriptions. He is paid \$20 to start selling and then earns \$1.50 for each subscription he sells. The table shows the amount of money (M) Coen earns for selling n subscriptions.

n	M
0	\$20.00
1	\$21.50
2	\$23.00
3	\$24.50
4	\$26.00

- In previous work, you wrote a linear function rule describing the amount of money Coen earns as a function of the number of subscriptions he sells. What do the domain and range of this situation represent?
- Fill in the blanks below to find the differences between the given entries in the table. For each table, make a statement summarizing the relationship between changes in the domain and changes in the range.

n	M
0	\$20.00
1	\$21.50
2	\$23.00
3	\$24.50
4	\$26.00

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3. Suppose Coen’s earning structure changed so that for every magazine subscription he sold, he made 1.5 times his previous earnings. Again, assume that he starts with \$20 for 0 subscriptions sold. Make a table showing Coen’s earnings.

n	M
0	
1	
2	
3	
4	

4. In Question 2, you analyzed changes in the domain values and their impact on the values in the range. Now analyze the new data set you found in Question 3. Do these data show the same kind of “add-add” relationship as in the linear relationship in Question 2? Describe the effect on values in the range for this new set of data when values in the domain are changed incrementally by adding 1. Is this relationship the same when adding 2 to each domain value? Adding 5? Explain your answers.
5. **REFLECTION:** Describe a fundamental difference between linear and exponential functions based on a look at tables of values. How is the rate of change of a **linear function** different than the rate of change of an **exponential function**?
6. **EXTENSION:** Describe two additional “add-add” relationships that exist in real-world applications, and provide at least two representations of the relationships. Describe two additional “add-multiply” relationships that exist in real-world applications, and provide at least two representations of the relationships. Be prepared to share your examples with the class.