Assignment

Write

Describe how to compare the slopes and *y*-intercepts of two linear functions if one is represented as a graph and one is represented as a table.

Remember

A linear function can be represented using an equation, a table, a graph, or with a verbal description. Characteristics of linear functions, such as slope, *y*-intercepts, and independent and dependent quantities can be understood from different representations of functions.

Practice

1. Bookstores specializing in selling used books award different amounts of points to customers who supply them with used books. The points are used toward the purchase of other books in the store. BookTraders lists its point values in a table, and Round the Block Books uses a graph to post its point values.

BookTraders Reward Points

2	12
4	24
6	36
8	48

Round the Block Books Reward Points
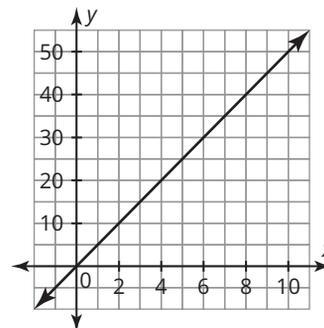
a. Label each column of values in the table and label the *x*-axis and *y*-axis on the graph with the appropriate variable quantities.

b. Compare the slope of each function and explain what each represents in context.

c. Compare the *y*-intercepts of each function and explain what each represents in context.

2. Sherry and Chris live in different cities. They are planning to meet in Nashville, but each will need to drive several days to get there. They have each calculated the distance to Nashville from their homes, but one calculated the distance in miles and the other calculated the distance in kilometers. Sherry uses an equation to convert the distances Chris plans to drive each day, and Chris uses a table to convert the distances Sherry plans to drive each day. The equation and part of the table are shown.

Chris's Table

300	482.80
382	614.77
426	685.58
475	764.44

Sherry's Equation

$$y = 0.6214x$$

a. Label each column of quantities in the table and identify the meaning of x and y in Sherry's equation. Who is converting from miles to kilometers and who is converting from kilometers to miles? Explain your reasoning.

b. Compare the slope for each function. Explain what each represents in context.

c. Compare the y-intercepts of each function and explain what each represents in context.

3. Alejandro and Maria collect movies. Maria's movie collection is shown in the graph. She started with 0 movies and added the same number of movies to her collection each month. In the 5th month, she had 15 movies. Alejandro's movie collection is given by a description.

Maria
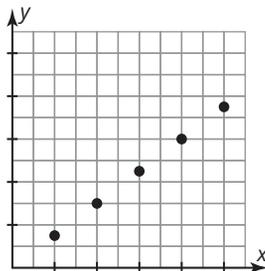
Alejandro

Alejandro started his collection with 27 movies he inherited from his uncle and continues to buy 2 movies each month.

a. Use what you know about Maria's movie collection to determine the scale of her graph. Label the x- and y-axis, the origin, and the intervals on both axes. Explain your reasoning.

b. Compare the slope for each function. Explain what each represents in context.

c. Compare the y-intercepts of each function and explain what each represents in context.

Stretch

1. Tim and Tom are twins. Their parents track their height every year between the ages of 5 and 15. Tim's height is given by the equation, and Tom's height is shown in the graph.

    a. Label the *x*- and *y*-axis, the origin, and the intervals on both axes. Explain your reasoning.

    b. Which twin is growing faster? Justify your answer.

    c. At what age does one twin surpass the other in height? Explain your reasoning.

Tim	**Tom**
$y = 3.1x + 40.6$	
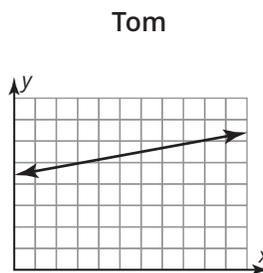
Review

1. For each situation decide whether the correlation implies causation. List reasons why or why not.

    a. The number of winter coats sold at department stores is highly correlated to average low temperatures in the area.

    b. The number of concessions sold at a concert is highly correlated to the number of people in attendance at the concert.

2. The graph represents the basic function $f(x) = x$. The equation for the transformed function $g(x)$ is $g(x) = \frac{2}{3} \cdot f(x) - 2$.

    a. Describe the transformations performed on $f(x)$ to produce $g(x)$.

    b. Graph $g(x)$.

    c. Write the equation of $g(x)$ in general form and identify the slope and *y*-intercept.

3. Write a recursive formula for each sequence.

    a. 3, −6, 12, −24, 48, ...   b. 180, 160, 140, 120, 100, ...