

LESSON

5-3

Linear Relationships and Bivariate Data***Practice and Problem Solving: C***

Does each of the tables represent a linear relationship? Explain why or why not. If the relationship is linear, then write an equation for the relationship.

1.

Time Filling Tank (min)	5	8	12
Water in Tank (gal)	37	55	79

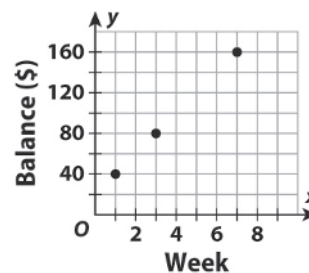
2.

Time (h)	2	6	9
Distance Traveled (mi)	124	372	552

Adrian regularly deposits money in his saving account. The graph shows the relationship between the balance in his account and the number of weeks he has been making deposits.

3. Find the balance of Adrian's account after he makes deposits for 5 weeks.

4. How many weeks does it take for the balance of Adrian's account to be \$140?



5. Adrian's sister, Lara, makes deposits to her savings account when Adrian makes his deposits. The balance y in dollars of Lara's account after x weeks is $y = 10x + 80$. Does Adrian or Lara have a greater balance after 4 weeks? Explain.

6. A ticket agency charges a processing fee for ticket purchases. The following ticket purchases were made for tickets to a concert.

- William spends \$132 on 4 tickets.
- Theo buys 2 tickets for \$72.
- The ticket agency charges Ellis \$252 for 8 tickets.

Use the information to complete the table. Then determine whether the relationship between tickets purchased and total cost is linear. If so, find the cost of 7 tickets.

Tickets	Total Cost (\$)

10. $y = 6x + 15$

11. \$87

Reteach

- slope: 0.2, y-intercept: 40,
equation: $y = 0.2x + 40$
- slope: 2.5, y-intercept: 2.5,
equation: $y = 2.5x + 2.5$

Reading Strategies

- The variable y represents the height (in inches) of the plant x days after it was planted.
- The description states that the relationship is a linear relationship. A linear relationship can be represented by a linear equation.
- Yes; as the x -values increase, the y -values increase as well. So, the slope is positive.
- The growth rate of the plant in inches per day
- The slope (using $(0, 15)$ and $(2, 20)$) is:

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{20 - 15}{2 - 0} = \frac{5}{2} = 2.5.$$
- On the y -axis; the y -intercept is 15.
- $y = 2.5x + 15$

Success for English Learners

- slope: 250
- y -intercept: 800
- $y = 250x + 800$
- Graph the ordered pairs from the table, draw a line through the points, and find the point where the line cross the y -axis; Sample answer: It may be difficult to determine the exact value for the y -intercept when reading it from a graph.

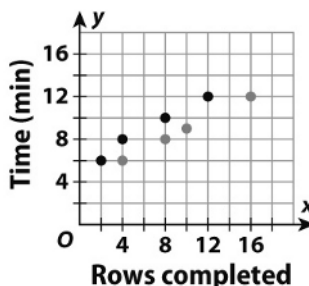
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Practice and Problem Solving: A/B

- Yes; the rate of change is constant.
- No; the rate of change is not constant.
- $y = 4x$
- $y = 2x + 8$
- yes; $y = 0.5x + 4$

6. 11 min

7.



No; the points do not lie on a straight line, so the rate of change is not constant.

Practice and Problem Solving: C

- Linear; the rate of change is constant; the gallons y of water in the tank is $y = 6x + 7$ after x minutes.
- Not linear; the rate of change is not constant.
- \$120
- 6 weeks
- Lara; Adrian's account balance will be \$100, and Lara's account balance will be \$120. Lara's account has the greater balance.

6.

Tickets	Total Cost (\$)
2	72
4	132
8	252

The relationship is linear; an equation for the relationship is $y = 30x + 12$, so the cost of 7 tickets is \$222.

Practice and Problem Solving: D

- Yes, because the rate of change is constant.
- No, because the rate of change is not constant.
- A
- B
- C
- B
- Linear; the rate of change is the babysitter's pay per hour, which is constant.