Lesson 3-1: Understand Relations and Functions

1. Sample answer: A relation is a function when each input value has exactly one output value.

2. Sample answer: In a table, look to see that each input value is listed only once; in an arrow diagram, see that each input value has only one arrow.

3. Sample answer: A function is always a relation, but a relation is not always a function. A relation is a function only if for each input value there is exactly one output value.

4. No; Sample answer: There are two output values, 40 and 50, for the input value of 20.

5. Yes; Sample answer: There is exactly one output value for each input value.

6. Yes; Sample answer: There is one output value for each input value.

7. a. See student work.
   b. Yes; Sample answer: There is exactly one number of tickets (output) sold for each day (input).

8. Yes; Sample answer: Each input value has a unique output value.

9. No; Sample answer: The two input values, 4 and 8, each have two output values.

10. Yes; Sample answer: For each time, there is exactly one temperature.

11. Yes; Sample answer: Each input value has exactly one output value.

12. Yes; Sample answer: This relation is a function because there is only one number of eggs for each week.

13. a. See student work.
    b. See student work.
    c. Relation P; Sample answer: Each input value has exactly one output value. For Relation Q, the input values have more than one output value.

14. Sample answer: Bobby likely reversed the input value and output value for the second ordered pair (6,12).

15. (49,13), (61,36), (10,27), (76,52), (23,52); Yes; Sample answer: Each input value corresponds to exactly one output value.

16. B, C