1. Write an expression: 7 more than a number x.

2. Determine if 3 is a solution of $2x - 4 = 2$.

3. Gail spent $4 more than twice as much as Casey at a store. If Casey spent $6, how much did Gail spend?

1.7 Notes

GOAL
Represent functions as rules and as tables.

Vocabulary
A **function** consists of:

- A set called the **domain** containing numbers called **inputs**, and a set called the **range** containing numbers called **outputs**.
- A pairing of inputs with outputs such that each input is paired with exactly one output.

The input variable is called an **independent variable.**

The output variable is called the **dependent variable** because its value depends on the value of the input variable.

EXAMPLE 1
Identify the domain and range of a function

The input-output table shows the price of various lobsters at a fish market. Identify the domain and range of the function. Input (pounds)

Input (Pounds)	1.5	2.3	3.1	4.2
Output (dollars)	$7.80	$11.96	$16.12	$21.82

Solution
The domain is the set of inputs: _____

The range is the set of outputs: _____

Exercises for Example 1

Identify the domain and range of the function.

1.

Input	2	5	7	8
Output	5	11	15	17

2.

Input	1	3	4	7
Output	2	8	11	20

Homework: Pages 44-45; #4-20 even

EXAMPLE 2
Make a table for a function
The domain of the function $y = x - 3$ is 2, 5, 8, and 11.

Make a table for the function, then identify the range of the function.

Solution

X	2	5	8	11
$Y = x - 3$				

The range of the function is:

Exercises for Example 2 ⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯

Make a table for the function. Identify the range of the function.

3. $y = 4x$
   Domain: 0, 3, 5, and 7

X				
Y				

4. $y = 3x - 22$
   Domain: 1, 2, 3, and 4

X				
Y				

EXAMPLE 3
Write a function rule

Write a rule for the function.

Input	3	6	7	10
Output	15	30	35	50

Homework: Pages 44-45; #4-20 even

Exercises for Example 3 ....

Write a rule for the function.

5.

Input	3	5	7	9
Output	14	16	18	20

6.

Input	6	7	8	9
Output	3	3.5	4	4.5

EXAMPLE 4
Write a function rule for a real-world situation _____

At a community art center, art lesson are offered at night. The fee is $12 per lesson. You plan to attend up to 5 lessons. Write the amount you will spend as a function of the number of lessons you attend. Identify the independent and dependent variables. Then identify the domain and range.

Homework: Pages 44-45; #4-20 even

Name _____   Date _____

1.7 Practice B   **Algebra 1**

Complete the sentence.
  1. The input variable is called the _____ variable.

  2. The output variable is called the _____ variable.
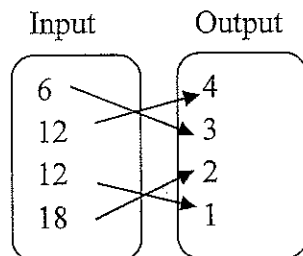
Tell whether the pairing is a function.
  3.

Input	Output
1	15
3	20
5	15
7	20

  4.

Input	Output
5	5
6	5
7	5
8	5

  5.

Input   Output

6   4
12   3
12   2
18   1

A) Make a table for the function. B) Identify the range of the function.

  6. $y = 4x - 2$
      Domain: 1, 2, 3, 4

X	Y

1.7 Practice B   Algebra 1

7. $y = 0.1x + 3$
    Domain: 10, 20, 30, 40

X	Y

8. $y = \dfrac{1}{2}x + 2$
    Domain: 6, 7, 8, 9

X	Y

Write a rule for the function.

9.

Input, x	1	2	3	4
Output, y	5	10	15	20

10.

Input, x	10	11	12	13
Output, y	3	4	5	6

1.7 Practice B   Algebra 1

11. **Shoe Sizes** The table shows men's shoe sizes in the United States and Australia. Write a rule for the Australian size as a function of the United States' size.

U.S. size	5	6	7	8	9	10
Australian size	3	4	5	6	7	8

12. **Balloon Bunches** You are making balloon bunches to attach to tables for a charity event. You plan on using 8 balloons in each bunch.
    a.) Write a rule for the total number of balloons used as a function of the number of bunches created.

    b.) Identify the independent and dependent variables.

    c.) How many balloons will you use if you make 10 bunches?

    d.)Baking A baker has baked 10 loaves of bread so far today and plans on baking 3 loaves more each hour for the rest of his shift.
    a.) Write a rule for the total number of loaves baked as a function of the number of hours left in the baker's shift.

    b.) Identify the independent and dependent variables.

    c.) How many loaves will the baker make if he has 4 hours left in his shift?

FUNCTIONS

Some relations are also **functions**. A relation is a function if **for every element in the domain, there is exactly one element in the range.** In other words, for each value for x there is only one unique value for y.

EXAMPLE 1: $\{(2, 4), (2, 5), (3, 4)\}$ is **NOT** a function because in the first pair, 2 is paired with 4, and in the second pair, 2 is paired with 5. The 2 can be paired with only one number to be a function. In this example, the x value of 2 has more than one value for y: 4 and 5.

EXAMPLE 2: $\{(1, 2), (3, 2), (5, 6)\}$ **IS** a function. Each first number is paired with only one second number. The 2 is repeated as a second number, but the relation remains a function.

Determine whether the ordered pairs of numbers below represent a function. Write "F" if it is a function. Write "NF" if it is not a function.

1. $\{(-1, 1), (-3, 3), (0, 0), (2, 2)\}$ _____

2. $\{(-4, -3), (-2, -3), (-1, -3), (2, -3)\}$ _____

3. $\{(5, -1), (2, 0), (2, 2), (5, 3)\}$ _____

4. $\{(-3, 3), (0, 2), (1, 1), (2, 0)\}$ _____

5. $\{(-2, -5), (-2, -1), (-2, 1), (-2, 3)\}$ _____

6. $\{(0, 2), (1, 1), (2, 2), (4, 3)\}$ _____

7. $\{(4, 2), (3, 3), (2, 2), (0, 3)\}$ _____

8. $\{(-1, -1), (-2, -2), (3, -1), (3, 2)\}$ _____

9. $\{(2, -2), (0, -2), (-2, 0), (1, -3)\}$ _____

10. $\{(2, 1), (3, 2), (4, 3), (5, -1)\}$ _____

11. $\{(-1, 0), (2, 1), (2, 4), (-2, 2)\}$ _____

12. $\{(1, 4), (2, 3), (0, 2), (0, 4)\}$ _____

13. $\{(0, 0), (1, 0), (2, 0), (3, 0)\}$ _____

14. $\{(-5, -1), (-3, -2), (-4, -9), (-7, -3)\}$ _____

15. $\{(8, -3), (-4, 4), (8, 0), (6, 2)\}$ _____

16. $\{(7, -1), (4, 3), (8, 2), (2, 8)\}$ _____

17. $\{(4, -3), (2, 0), (5, 3), (4, 1)\}$ _____

18. $\{(2, -6), (7, 3), (-3, 4), (2, -3)\}$ _____

19. $\{(1, 1), (3, -2), (4, 16), (1, -5)\}$ _____

20. $\{(5, 7), (3, 8), (5, 3), (6, 9)\}$ _____