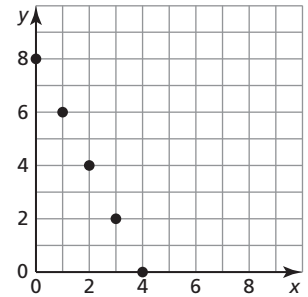Name_____ Date _____

Functions

3.1

For use with Exploration 3.1

Essential Question What is a function?

1 EXPLORATION: Describing a Function

Work with a partner. Functions can be described in many ways.

- by an equation
- by an input-output table
- using words
- by a graph
- as a set of ordered pairs

a. Explain why the graph shown represents a function.

b. Describe the function in two other ways.

2 EXPLORATION: Identifying Functions

Work with a partner. Determine whether each relation represents a function. Explain your reasoning.

a.

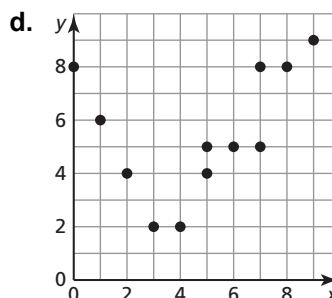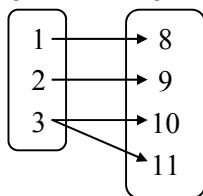| Input, x	0	1	2	3	4
Output, y	8	8	8	8	8

b.

Input, x	8	8	8	8	8
Output, y	0	1	2	3	4

3.1 **Functions** (continued)

2 **EXPLORATION:** Identifying Functions (continued)

c. Input, *x* Output, *y*

```
1 ──────→ 8
2 ──────→ 9
3 ──────→ 10
          11
```

d.

e. $(-2, 5), (-1, 8), (0, 6), (1, 6), (2, 7)$

f. $(-2, 0), (-1, 0), (-1, 1), (0, 1), (1, 2), (2, 2)$

g. Each radio frequency *x* in a listening area has exactly one radio station *y*.

h. The same television station *x* can be found on more than one channel *y*.

i. $x = 2$

j. $y = 2x + 3$

Communicate Your Answer

3. What is a function? Give examples of relations, other than those in Explorations 1 and 2, that (a) are functions and (b) are not functions.

Name_____ Date_____

<table>
<tr><td>**3.1**</td><td>**Notetaking with Vocabulary**
For use after Lesson 3.1</td></tr>
</table>

In your own words, write the meaning of each vocabulary term.

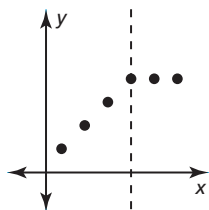relation

function

domain

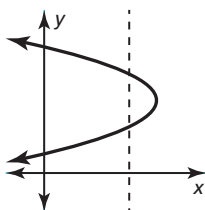range

independent variable

dependent variable

Notes:

3.1　**Notetaking with Vocabulary (continued)**

Core Concepts

Vertical Line Test

Words　A graph represent a function when no vertical line passes through more than one
point on the graph.

Examples　Function　　　　　　　　Not a function

Notes:

The Domain and Range of a Function

The **domain** of a function is the set of all possible input values.

The **range** of a function is the set of all possible output values.

Notes:

Name_____ Date _____

Extra Practice

In Exercises 1 and 2, determine whether the relation is a function. Explain.

1.
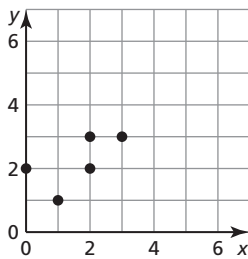
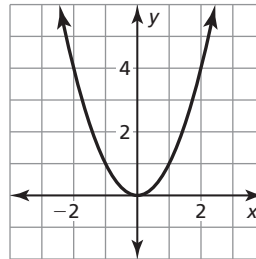| Input, x	–2	0	1	–2
Output, y	4	5	4	5

2. $(0, 3), (1, 1), (2, 1), (3, 0)$

In Exercises 3 and 4, determine whether the graph represents a function. Explain.
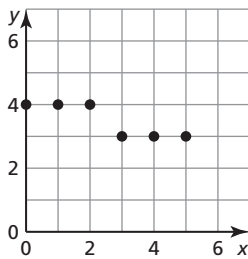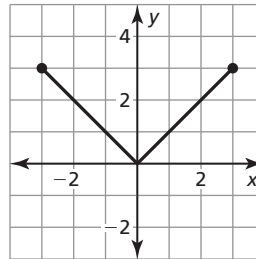
3.

4.

In Exercises 5 and 6, find the domain and range of the function represented by the graph.

5.

6.

7. The function $y = 12x$ represents the number y of pages of text a computer printer can print in x minutes.

    a. Identify the independent and dependent variables.

    b. The domain is 1, 2, 3, and 4. What is the range?