

### 5.7 Defining "Function" ... For Reals

**Relationships:** Remember that we have been looking at relationships between input values and output values. We can model those relationships with tables, graphs, ordered pairs, equations, and *maps*.

**An Example of a Relationship**

**Ordered Pairs:**  $\{ (2,5), (-2,3), (5,-2), (-1,-2) \}$

**Maps**

**Table**

| input | output |
|-------|--------|
| 2     | 5      |
| -2    | 3      |
| 5     | -2     |
| 1     | -2     |

**Graph**

The really real definition of a function is:

A **function** is a relationship between a set of inputs and outputs. In a function, *there is exactly one output for each input.*

Think about this addition to the definition that we had before and circle the relationships that are **functions** in each category.

**Tables**

| input | output |
|-------|--------|
| -2    | 3      |
| 1     | -2     |
| 2     | 5      |
| 5     | -2     |

| input | output |
|-------|--------|
| -3    | 2      |
| -2    | 4      |
| 1     | 3      |
| 1     | -2     |

| input | output |
|-------|--------|
| 1     | 1      |
| 1     | -1     |
| 4     | 2      |
| 4     | -2     |

| input | output |
|-------|--------|
| 0     | 2      |
| 1     | 6      |
| 2     | 18     |
| 3     | 54     |

**Ordered Pairs**

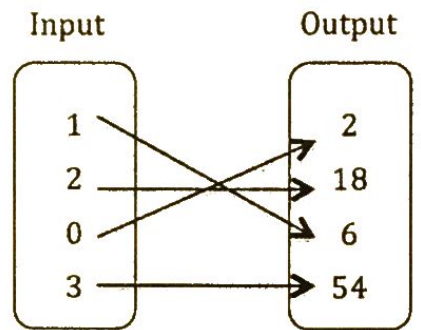
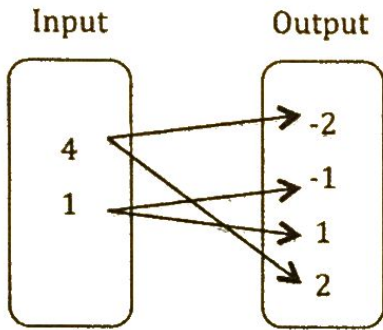
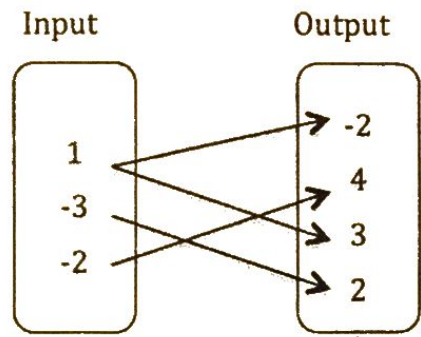
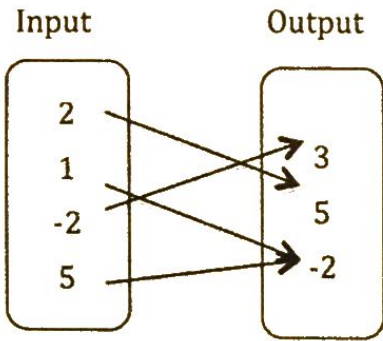
$\{ (-2, 3), (1, -2), (2,5), (5, -2) \}$

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

$\{ (1, 1), (1, -1), (4, 2), (4, -2) \}$

$\{ (0, 2), (1, 6), (2, 18), (3, 54) \}$

# Maps



# Graphs

