Sec. 5.1 – Representing Relations

- When one type of information is connected to another type of information we say they are related. For example, time and distance travelled or height and weight. When the value of one piece of information changes, so does the value of the other. These are called **relations**.

- A **relation** can be shown as a set of ordered pairs. The order of the values or elements of the pairs of numbers is important.

- The set of all the first values or elements in these ordered pairs is called the **domain** of the relation.

- The set of all the second values or elements in these ordered pairs is called the **range** of the relation.

Example 1

State the domain and range of the relation (1, 3), (2, 6), (3, 9).

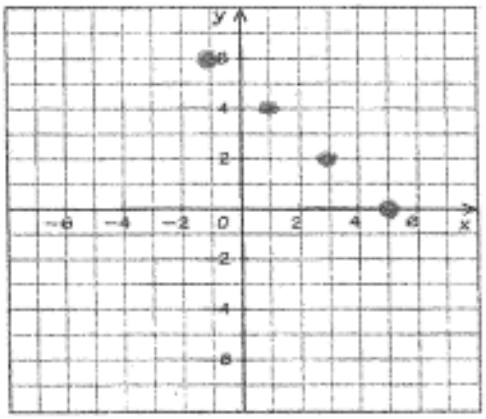
Solution: Domain is {1, 2, 3} – these are the first values in each ordered pair
Range is {3, 6, 9} - these are the second values in each ordered pair

- Relations can be described in different ways. For example, in addition to ordered pairs, they could be shown in tables, graphs, described with words, equations or with diagrams. Examples of these follow.

1. Table of values

x	y
1	4
3	2
5	0
-1	6

2. Graph



3. Words

The sum of two numbers is five.

4. Equation

$x + y = 5$

or $y = -x + 5$

or $x = 5 - y$

5. Arrow Diagram

$1 \rightarrow 4$

$3 \rightarrow 2$

$5 \rightarrow 0$

$-1 \rightarrow 6$

1. Animals can be associated with the classes they are in.

Animal	**Class**
ant	Insecta
eagle	Aves
snake	Reptilia
turtle	Reptilia
whale	Mammalia

a) Describe this relation in words.

b) Represent this relation:

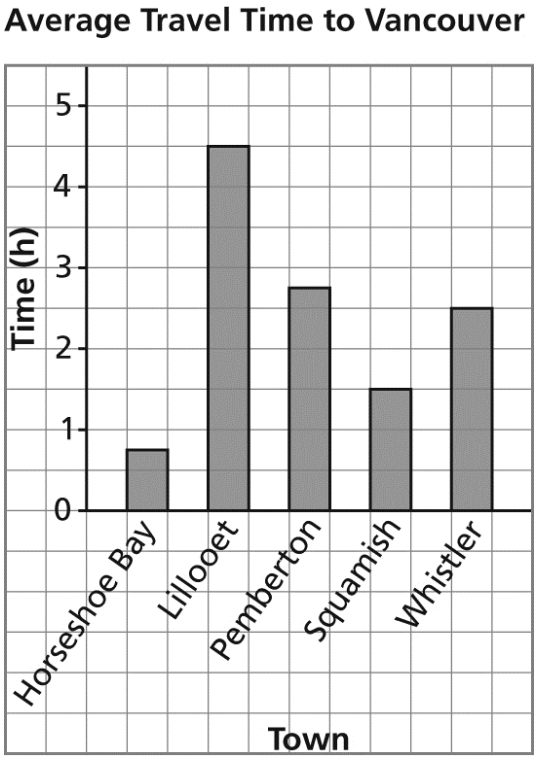
i) as a set of ordered pairs

ii) as an arrow diagram

2. Different towns in British Columbia can be associated with the average time, in hours, that it takes to drive to Vancouver.
Consider the relation represented by this graph.

Represent the relation:

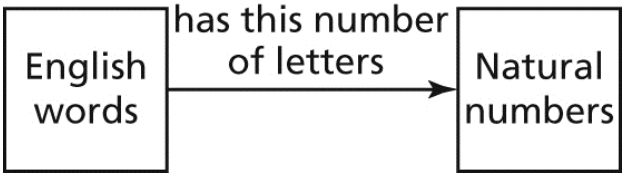
a) as a table



Town	Average Time (h)
Horseshoe Bay	
Lillooet	
Pemberton	
Squamish	
Whistler	

b) as an arrow diagram

3. In the diagram below:



a) Describe the relation in words.

b) List 2 ordered pairs that belong to the relation.