## *Relations*

A **relation** is a set of ordered pairs. The **domain** of a relation is
the set of all first coordinates of the ordered pairs, and the
range is the set of all second coordinates.

Example 1: State the domain and range of each relation.
   1. {(3, 3), (3, 4), (3, 5)} Domain = {3}; Range = {3, 4, 5}
   2. {(1, 2), (2, 1), (3, 2)} Domain = {1, 2, 3}; Range = {1, 2}

Relations may be expressed in the form of ordered pairs, tables,
graphs, and mappings.

Example 2: The relation {(1, 1), (0, 2), (3, −2)} can be expressed
   in each of the following ways.

Ordered pairs	Table	Graph	Mapping

Ordered pairs
(1, 1)
(0, 2)
(3, −2)

Table

x	y
1	1
0	2
3	−2

Graph
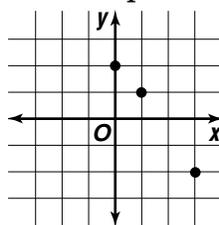
Mapping
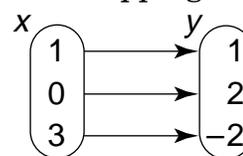
The **inverse** of any relation is obtained by switching the
coordinates in each ordered pair.

State the domain and range of each relation.

1. {(−6, 5), (−3, 8), (−6, 9), (3, 11)}

2. {(0.8, −0.8), (1.2, 0), (3.5, 4)}

3. $\left\{\left(\frac{1}{2}, \frac{1}{4}\right), \left(1\frac{1}{2}, 1\frac{1}{4}\right), \left(3\frac{1}{2}, 2\right)\right\}$

Express the relations shown in each table, mapping, or graph as a set of ordered pairs. Then state the domain, range, and inverse of the relation.

4.

x	y
1	3
2	4
3	6

5.
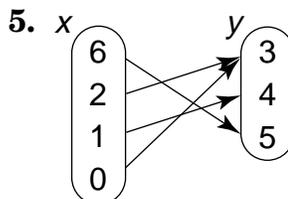
Draw a mapping and graph for each relation.

6. {(−2, −1), (3, 3), (4, 3)}   **7.** {(0, 0), (1, 1), (2, 2)}