

### 4.1 – Relations, Domain and Range

Relation: **a set of ordered pairs**

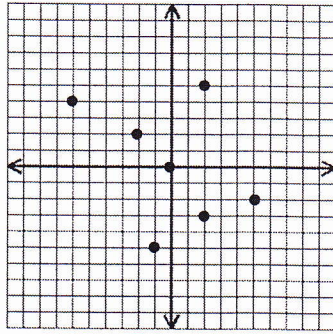
Relations can be expressed in 4 different ways:

**Ordered pairs, graph, table, or mapping**

1. Represent the relation shown in the graph as:

a) a set of ordered pairs

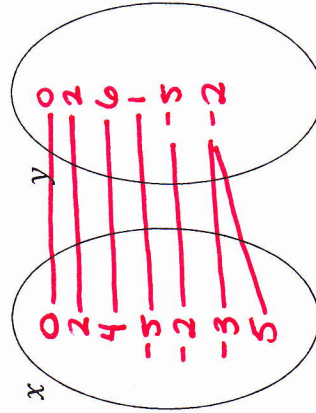
**$\{(0,0), (2,2), (4,6), (-5,1), (-2,-5), (-3,-2), (5,-2)\}$**



b) a table

x	y
0	0
2	2
4	6
-5	1
-2	-5
-3	-2
5	-2

c) a mapping



Domain:

**the set of the x-values**

Range:

**the set of the y-values**

Function:

**a relation in which all the x's are different**

State the domain and range. Then determine whether or not the relation is a function.

2.  $\{(2,4), (3,5), (6,5), (-1,3)\}$

$D = \{2, 3, 6, -1\}$  Function? **Yes**

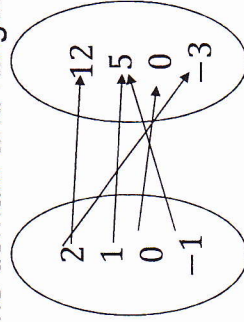
$R = \{4, 5, 3\}$

3.  $\{(1,9), (-2,5), (1,6), (-4,-3), (2,8)\}$

$D = \{1, -2, -4, 2\}$  Function? **No**

$R = \{9, 5, 6, -3, 8\}$

4. Express the relation shown as ordered pairs. Then state the domain and range. Is it a function? **No**

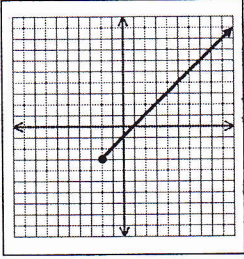


**$\{(2,12), (2,-3), (1,5), (0,0), (-1,5)\}$**

Domain:  **$\{2, 1, 0, -1\}$**

Range:  **$\{12, -3, 5, 0\}$**

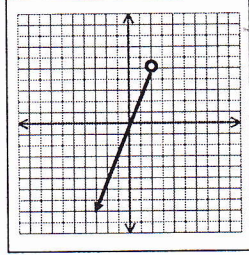
Find the domain and range from the graph.



4.

Domain:  $x \geq -3$

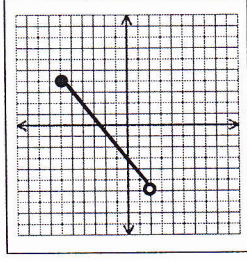
Range:  $y \leq 2$



5.

Domain:  $x < 5$

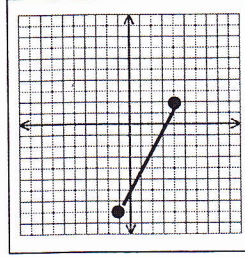
Range:  $y > -2$



6.

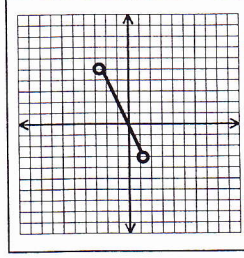
Domain:  $-6 < x \leq 4$   $(-6, 4]$

Range:  $-2 < y \leq 6$   $(-2, 6]$



6.

7.



Domain:  $-8 \leq x \leq 2$   $[-8, 2]$

Range:  $-4 \leq y \leq 1$   $[-4, 1]$

Domain:  $-3 < x < 5$   $(-3, 5)$

Range:  $-1 < y < 2$   $(-1, 2)$