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Algebra - Downing Relations + Functions

Relation - a relationship that is represented by ordered pairs, tables, graphs or mapping diagrams.

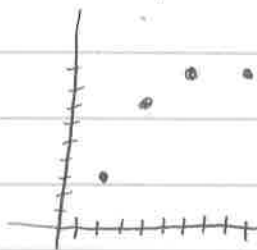
(x, y)
Ordered Pairs

Express the relation $\{(2, 3), (4, 7), (6, 8), (9, 8)\}$

Table

x	y
2	3
4	7
6	8
9	8

Graph



Mapping Diagram



Function - Special relation where each x-value has only one y-value

a)

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

 → Function Each input has one output

b)

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

 → Not a Function 8 has 5 different outputs

Vertical Line Test - a graph represents a function when no vertical line passes through more than one point on the graph.



Vertical Line goes through once
Yes it is a Function



Vertical line goes through twice
Not a Function

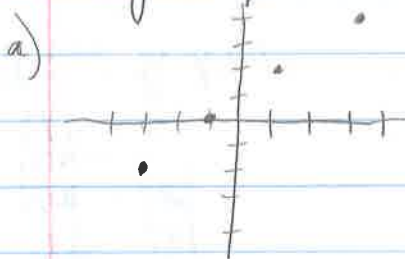
Domain + Range

x-values The domain of a function is the set of all possible input values

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

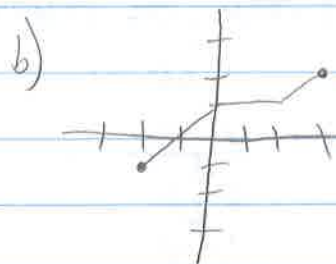
Domain: Independent Variables

Range: Dependent Variables



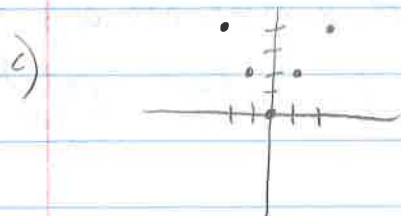
$$D: \{-3, -1, 1, 3\}$$

$$R: \{-2, 0, 2, 4\}$$



$$D: \{-2 \leq x \leq 3\}$$

$$R: \{-1 \leq y \leq 2\}$$



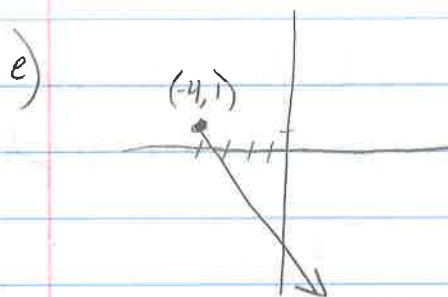
$$D: \{-2, -1, 0, 1, 2\}$$

$$R: \{0, 2, 4\}$$



$$\leftrightarrow D: \{1 \leq x \leq 5\}$$

$$\downarrow R: \{0 \leq y \leq 4\}$$



$$D: \{x \geq -4\}$$

$$R: \{y \leq 1\}$$



$$D: \{x \in \mathbb{R}\} \text{ } x \text{ is the set of all real numbers}$$

$$R: \{y \in \mathbb{R}\} \text{ } y \text{ is the set of all real numbers}$$

HW: pg 108 #3-8, 10-12, 14-16, 18