

7. If $R_1 = \{(x, y) \mid y = 2x + 7, \text{ where } x \in \mathbb{R} \text{ and } -5 \leq x \leq 5\}$ is a relation. Then find the domain and Range of R_1 .

Solution:

According to the question,

$R_1 = \{(x, y) \mid y = 2x + 7, \text{ where } x \in \mathbb{R} \text{ and } -5 \leq x \leq 5\}$ is a relation

The domain of R_1 consists of all the first elements of all the ordered pairs of R_1 , i.e., x ,

It is also given $-5 \leq x \leq 5$.

Therefore,

Domain of $R_1 = [-5, 5]$

The range of R contains all the second elements of all the ordered pairs of R_1 , i.e., y

It is also given $y = 2x + 7$

Now $x \in [-5, 5]$

Multiply LHS and RHS by 2,

We get,

$2x \in [-10, 10]$

Adding LHS and RHS with 7,

We get,

$2x + 7 \in [-3, 17]$

Or, $y \in [-3, 17]$

So,

Range of $R_1 = [-3, 17]$