

03/09/xx Class-XI<sup>sc</sup> (MATHS) K. Kanhaiya

Total Topic: Relations and Functions

Given two non-empty sets P and Q  
The Cartesian product  $P \times Q$   
is the set of all  
Ordered pairs of elements  
from P to Q, i.e.

$$P \times Q = \{(p, q) : p \in P, q \in Q\}$$

If either P or Q is null set,  
then  $P \times Q$  will also  
be empty set. i.e.  
 $P \times Q = \phi$ ,

$$\text{If } n(A) = p \\ n(B) = q$$

$$\text{then } n(A \times B) = p \times q = pq.$$

Ex-1 If  $(x+1, y-2) = (3, 1)$ , find  
x and y

Ans  $\rightarrow$

$$x+1 = 3, \quad y-2 = 1$$

$$x = 3-1, \quad y = 1+2$$

$$x = 2, \quad y = 3$$



$$(2) \text{ If } P = \{a, b, c\} \text{ and } Q = \{x\}$$

, form the sets  $P \times Q$  and  $Q \times P$

Ans Are there two products equal?

By definition

$$P \times Q = \{a, b, c\} \times \{x\}$$

$$= \{(a, x), (b, x), (c, x)\}$$

$$Q \times P = \{x\} \times \{a, b, c\}$$

$$= \{(x, a), (x, b), (x, c)\}$$

$$(3) \text{ If } \left(\frac{x}{3} + 1, y - \frac{2}{3}\right) = \left(\frac{5}{3}, \frac{1}{3}\right)$$

$$\frac{x}{3} + 1 = \frac{5}{3}, \quad y = \frac{1}{3} + \frac{2}{3}$$

$$\frac{x}{3} = \frac{5}{3} - 1, \quad y = \frac{3}{3}$$

$$\frac{x}{3} = \frac{5-3}{3}, \quad y = 1$$

$$\frac{x}{3} = \frac{2}{3}$$

$$x = 2$$

Solve Ex- 2.1. (N.C.E.R.T)