Conditions

If A and B are non-empty sets ,then the set of all ordered pairs (a,b) with a∈A and b∈B is known as ....

(A) function product
(B) Cartesian product
(C) mapping product
(D) transformation product

Please explain

Solution

The Cartesian plane is the result of the Cartesian product of two sets X and Y, which refer to points on the x-axis and points on the y-axis, respectively. This Cartesian product can be denoted as X × Y. **This produces the set of all possible ordered pairs whose first component is a member of X and whose second component is a member of Y** (e.g., the whole of the x–y plane). Alternatively, the Cartesian product can be denoted as Y x X, in which case the first component of the order pair is a member of Y and the second component of the ordered pair is a member of X. The Cartesian product is therefore not commuative.

$$X \times Y = \{\, (x,y) \mid x \in X \ \wedge \ y \in Y \,\}.$$
$$Y \times X = \{\, (y,x) \mid y \in Y \ \wedge \ x \in X \,\}.$$

$$X \times Y \neq Y \times X$$

Answer: B