39. If

$$P = \{1, 2\},$$

then

$$P \times P \times P = \{(1, 1, 1), (2, 2, 2), (1, 2, 2), (2, 1, 1)\}.$$

Ans: Given:

$$P = \{1, 2\}.$$

First, find the total number of elements

$$n(P \times P \times P).$$

Then, compare.

$P = \{1, 2\}$ and $n(P) = 2$

$\therefore n(P \times P \times P) = 8$

But there are 4 elements

Therefore, False

40. If

$$A = \{1, 2, 3\}, B = \{3, 4\} \text{ and } C = \{4, 5, 6\},$$

then

$(A \times B) \cup (A \times C) = \{(1, 3), (1, 4), (1, 5), (1, 6), (2, 3), (2, 4), (2, 5), (2, 6), (3, 3), (3, 4), (3, 5), (3, 6)\}$

Ans: Given:

$A = \{1, 2, 3\},$

$B = \{3, 4\},$

$C = \{4, 5, 6\}.$

First, find

$$A \times B \text{ and } A \times C,$$

then find

$$(A \times B) \cup (A \times C).$$

$A \times B = \{(1, 3), (1, 4), (2, 3), (2, 4), (3, 3), (3, 4)\},$

$A \times C = \{(1, 4), (1, 5), (1, 6), (2, 4), (2, 5), (2, 6), (3, 4), (3, 5), (3, 6)\},$

$(A \times B) \cup (A \times C) = \{(1, 3), (1, 4), (1, 5), (1, 6), (2, 3), (2, 4), (2, 5), (2, 6), (3, 3),$

$(3, 4), (3, 5), (3, 6)\}.$

Therefore, True.