

Show that- $(P \cap Q) \times (R \cap S) = (P \times R) \cap (Q \times S)$

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$$(P \cap Q) \times (R \cap S) = (P \times R) \cap (Q \times S)$$

For some arbitrary sets P, Q, R and S

Consider (x, y)

$$(x, y) \in (P \cap Q) \times (R \cap S)$$

$$x \in (P \cap Q) \wedge y \in (R \cap S)$$

$$(x \in P \text{ and } x \in Q) \wedge (y \in R \text{ and } y \in S)$$

$$(x \in P \wedge y \in R) \text{ and } (x \in Q \wedge y \in S)$$

$$(x, y) \in (P \times R) \text{ and } (x, y) \in (Q \times S)$$

$$(x, y) \in ((P \times R) \cap (Q \times S))$$

$$(x, y) \in ((P \times R) \cap (Q \times S))$$

$$(P \times R) \cap (Q \times S)$$

Related posts:

1. SET
2. Mathematical induction
3. Relation
4. Net 34
5. prove that- $A \times (B \cap C) = (A \times B) \cap (A \times C)$
6. Prove that- $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$
7. prove that - $(A \cap B) \times (C \cap D) = (A \times C) \cap (B \times D)$
8. Binary operations
9. Algebraic structure
10. Group

Show that- $(PnQ)X(RnS) = (PXR)n(QXS)$

11. Show that $\{\dots, -4, -3, -2, -1, 0, 1, 2, 3, 4, \dots\}$ is group
12. Show that $a*b=b*a$
13. if $a*c = c*a$ and $b*c = c*b$, then $(a*b)*c = c*(a*b)$
14. Undirected Graph and Incident Matrix
15. Prove the following by using the principle of mathematical induction for all $n \in \mathbb{N}$, $1^3 + 2^3 + 3^3 + \dots + n^3 = [n(n+1)/2]^2$
16. Prove that $G=\{-1,1,i,-i\}$ is a group under multiplication.
17. Hasse diagram for the “less than or equal to” relation on the set $S= \{ 0,1,2,3,4,5\}$