$$
\text { prove that }-(A \cap B) X(C \cap D)=(A X C) \cap(B X D)
$$

## If $A, B, C, D$ are any four sets then prove that $(A \cap B) X(C \cap D)=(A X C) \cap(B X D)$

Consider( $\mathrm{x}, \mathrm{y}$ )
$(x, y) \in(A \cap B) \times(C \cap D)$
$x \in(A \cap B) \wedge y \in(C \cap D)$
$(x \in A$ and $x \in B) \wedge(y \in C$ and $y \in D)$
$(x \in A \wedge y \in C)$ and $(x \in B \wedge y \in D)$
$(x, y) \in(A \wedge C)$ and $(x, y) \in(B \wedge D)$
$(x, y) \in((A \wedge C)$ and $(B \wedge D))$
$(x, y) \in((A \times C) \cap(B \times D))$
$(A \times C) \cap(B \times D)$

Related posts:

1. SET
2. Mathematical induction
3. Relation
4. Net 34
5. prove that- $A X(B \cap C)=(A X B) \cap(A X C)$
6. Prove that- $A \cap(B \cup C)=(A \cap B) \cup(A \cap C)$
7. Show that- $(P \cap Q) X(R \cap S)=(P X R) \cap(Q X S)$
8. Binary operations
9. Algebraic structure
10. Group
11. Show that (..., $-4,-3,-2,-1,0,1,2,3,4, \ldots\}$ is group

$$
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$$

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 $n \in N, 1^{3}+$ $2^{3}+3^{3}+\ldots+n^{3}=[n(n+1) / 2]^{2}$
16. Prove that $\mathrm{G}=\{-1,1, \mathrm{i},-\mathrm{i}\}$ is a group under multiplication.
17. Hasse diagram for the "less than or equal to" relation on the set $S=\{0,1,2,3,4,5\}$
