Exercise

1. Using Venn diagram prove that $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$.
2. Prove that $(a) A \cup (A^C \cap B) = A \cup B and (b) A \cap (A^C \cup B) = A \cap B$.
3. A relation R is defi ned as a R b if $a^2 - b^2$ is divisible by 5, where a and b are integers. Prove that R is an equivalence relation.
4. A relation R is defi ned on set N (natural numbers) such that $R = \{(a, b) \in N \times N \; if \; 'a' \; is$ a divisor of $'b'\}$. Examine if R is reflexive, symmetric, and transitive.
5. Check whether the relation power defi ned as ab, where a and b are natural numbers, is closed or not.