Maths Formula Sheet

Chapter by chapter, topic by topic. Written by the PadhoNa team for quick revision.

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CHAPTER 13

Sets and Relations

Sets

UNION AND INTERSECTION

$$n(A \cup B) = n(A) + n(B) - n(A \cap B)$$

THREE SETS

$$n(A \cup B \cup C) = \sum n(A) - \sum n(A \cap B) + n(A \cap B \cap C)$$

DE MORGAN

$$(A \cup B)' = A' \cap B', \qquad (A \cap B)' = A' \cup B'$$

DIFFERENCE

$$A - B = A \cap B', \qquad n(A - B) = n(A) - n(A \cap B)$$

POWER SET

$$n(A) = m \;\Rightarrow\; n(P(A)) = 2^m$$

Relations

NUMBER OF RELATIONS

$$n(A) = m,\ n(B) = n: \quad 2^{mn} \text{ relations from } A \text{ to } B$$

TYPES

$$\text{reflexive: } (a,a) \in R\ \forall a; \qquad \text{symmetric: } (a,b) \in R \Rightarrow (b,a) \in R;$$

$$\text{transitive: } (a,b),(b,c) \in R \Rightarrow (a,c) \in R$$

COUNTS ON A SET OF N ELEMENTS

$$\text{reflexive: } 2^{n^2-n}, \qquad \text{symmetric: } 2^{\frac{n(n+1)}{2}}$$

EQUIVALENCE RELATION

reflexive+symmetric+transitive

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