

SETS and COUNTING FORMULAS

DeMorgan's Laws for Set:

$$\overline{(A \cup B)} = \overline{A} \cap \overline{B}$$

and

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Cardinal Number Rules:

for unions and intersections:

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

and

for complements:

$$n(A) + n(\overline{A}) = n(U)$$

Permutations: ${}_n P_r = \frac{n!}{(n-r)!}$

Combinations: ${}_n C_r = \frac{n!}{r!(n-r)!}$

Factorials:

$$n! = (n) * (n-1) * (n-2) * (n-3) * \dots * 3 * 2 * 1$$

and

$$0! = 1$$

