8.10.2024

≥ 5 attendances

Seminar — 10% of grade.

(0.5 / solution) + (0.5 per attendance)

seminar 2-6 : 2 bonus problems (1 point each).

all points will add up to max 10, the max grade of the seminar

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$$A_n^k = \frac{n!}{(n-k)!}$$

$a_1, \dots, a_n$ distinct

choose k

$a_{i_1}, \dots, a_{i_k}$ distinct, ordered

a b c d e

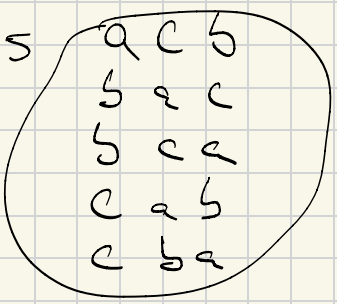
C_5^2

A_5^2 ab ac ad

ba ca da ....

C_5^3 abc add abe

A_5^3 abc



$\{\underbrace{a, b, c}_{k!}\}$

$A_m^k = C_m^k \cdot P_k$

$A \setminus B = A \cap \bar{B}$

$\overline{\bigcup_{i \in I} A_i} = \bigcap_{i \in I} \bar{A}_i$

$\overline{\bigcap_{i \in I} A_i} = \bigcup_{i \in I} \bar{A}_i$

4) n latex tickets

A_i => i-th ticket wins

a) $A_1 \cap A_2 \cap \dots \cap A_n$

b) $\overline{A_1} \cap \overline{A_2} \cap \dots \cap \overline{A_n} = \overline{\bigcup_{i \in \overline{1,n}} A_i}$

c) $A_1 \cup A_2 \cup \dots \cup A_n$

d) $(A_1 \cap \overline{A_2} \cap \overline{A_3} \cap \dots \cap \overline{A_n}) \cup (\overline{A_1} \cap A_2 \cap \dots \cap \overline{A_n}) \cup \dots \cup (\overline{A_1} \cap \overline{A_2} \cap \dots \cap A_n)$

e) $\bigcup (A_j \cap A_k \cap (\overline{\bigcup A_I}))$

→ where $j \neq k$ and $j, k \in \overline{1,n}$

$I = \overline{1,n} \setminus \{j,k\}$

f) $\bigcup (A_j \cap A_k \cap (\overline{\bigcup A_I})) \cup (\bigcup (A_j \cap A_k \cap A_\ell \cap (\overline{\bigcup A_I})) \cup \dots \cup \dots \quad (\geq 2)$

g) f) ∪ e) OR b) ∪ d) ∪ e)

2. Find the number of possible outcomes for the following events:
a) three dice are rolled;
b) two letters and three digits are randomly selected.

a) $6^3 = 36 \cdot 6 = 216$ $\quad f: \{d_1, d_2, d_3\} \to \{1,2,3,4,5,6\}$

$6^3 = |B|^{|A|}$

b) $26^2 \cdot 10^3 \cdot C_5^3$