



## MUAMMOLI MASALA VA TOPSHIRIQLAR:

1. Quyidagi ifodalarning qiymati topilsin:

1)  $\frac{14!}{12!}$ ; 2)  $\frac{16!}{18!}$ ; 3)  $\frac{9!}{5! \cdot 4!}$ ; 4)  $8! + 9!$ .

2. Quyidagilarni isbotlang:

1)  $\frac{(m+3)!}{m!} = (m+1)(m+2)(m+3)$ ;

2)  $\frac{n!}{(n-m)!} = n(n-1) \cdots (n-m+2)(n-m+1)$ , bunda  $n > m$ .

3. Amallarni bajaring:

1)  $\frac{1}{n!} - \frac{1}{(n+1)!}$ ; 2)  $\frac{1}{(k-1)!} - \frac{1}{k!}$ .

4. To'qqizta har xil qiymatli raqam bilan nechta to'qqiz xonali son yozish mumkin?

Javob: 362880.

5. 12 kishilik ovqat hozirlangan stolga 12 kishini necha turli o'tqazish mumkin?

Javob: 479001600.

6. Musobaqada 6 ta talaba qatnashmoqda. O'rinlarni ular o'rtasida necha xil usul bilan taqsimlash mumkin?

7. Talaba 6 ta kitobdan 4 tasini necha usul bilan ajratishi mumkin?

8. Ma'lum bo'limda ishlash uchun 20 nafar ishchidan 6 nafar ishchini ajratish kerak. Buni necha usul bilan amalga oshirish mumkin?

9. Tenglik to'g'riligini isbotlang:

1)  $C_7^4 + C_7^3 = C_8^4$ ; 2)  $C_{10}^5 + C_{10}^6 = C_{11}^6$ .

10. Ifodani soddalashtiring:

$$\frac{3}{2(2n-1)} C_n^{2n-3}.$$

11. Musobaqada 12 ta jamoa ishtirok etadi. Uchta turli medalni necha xil usul bilan taqsimlash mumkin?

Javob:  $A_{12}^3 = 1320$ .

12. Gruppada 30 ta o'quvchi bor. Ularning ichidan 3 kishini kompyuterda ishlash uchun ajratish kerak. Buni necha usul bilan bajarish mumkin?

Javob:  $C_{30}^3 = 4060$ .

13. Turli rangdagi 5 to'p mato bor. Bu matolardan har bir mato faqat bitta polosani egallaydigan qilib nechta turli besh rangli bayroqlar tayyorlash mumkin?

Javob:  $P_5 = 5! = 120$ .

14. Tenglamani yeching:

$$1) \frac{P_{n+2}}{P_n} = 72; \quad 2) A_x^4 = A_{x-2}^2.$$

15.  $n(n>2)$  ta elementdan  $n-3$  tadan kombinatsiyalar va o'rinlashtirishlar sonini aniqlang.

16.  $(2+e^n)^5$  binomning yoyilmasini yozing.

17.  $(x-3)^n$  ( $n>5$ ) binom yoyilmasidagi  $x^4$  daraja oldidagi koeffitsiyentni toping.

18. Tengkuchlilikni isbotlang.

$$1. |A_1 \cap A_2 \cap A_3 \cap \dots \cap A_n| = |A_1| + |A_2| + |A_3| + \dots + |A_n| - |A_1 \cup A_2| - |A_1 \cup A_3| - \dots - |A_{n-1} \cup A_n| + |A_1 \cup A_2 \cup A_3| + |A_1 \cup A_2 \cup A_4| + \dots + |A_{n-2} \cup A_{n-1} \cup A_n| - \dots + (-1)^{n-1} |A_1 \cup A_2 \cup \dots \cup A_n|.$$

$$2. |A \cup B| = |A| + |B| - |A \cap B|$$

$$3. |A \times B| = |A| \cdot |B|$$

$$4. |A \cup B| = |A| + |B|$$

$$5. |2^A| = 2^{|A|}$$

$$6. |A \cup B| = |A| + |B| - |A \cap B|$$