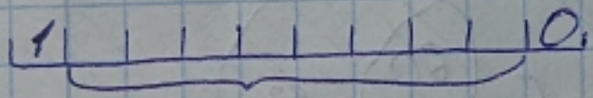
К232.

Евдокимова А.И.

Вариант 5.

1	$C_8^5 = C_8^3$
2	C_{49}^{14}
3	$6^6 = 46656$
4	bbabbba
5	47
6	36574 21
7	а) $N = 18$ или $N = 47$ б) $C_{22}^4 - 5C_9^4$
8	$\frac{7}{9}$

1.



8 цветов и 5 „1"

Ответ: $C_8^5 = C_8^3$

2. $x_1 + x_2 + \ldots + x_{15} = 80 \quad x_i \geq 3$

$y_i = x_i - 2, \quad y_i \geq 1$

$y_1 + y_2 + \ldots + y_{15} = 80 - 2 \cdot 15 = 50$

Ответ: C_{49}^{14}

3. $\underbrace{\square\square\square\square\square\square}_{6\cdot6\cdot6\cdot6\cdot6\cdot6}$ (0, 1, 2, 3, 4, 5, 6)

Ответ: $6^6 = 46656$

4.

10'11	3					
9	337	3				
11	3	112	3			
9	3	9	37	3		
21	7	22	3	12	3	
21	6	21	7	12	4	3
0	1	1	6	0	3	1 | 3
			1		1	0 | 0
						1

{a, b, c}
0 1 2

110110

Ответ: bbabba

5. 90 - всего

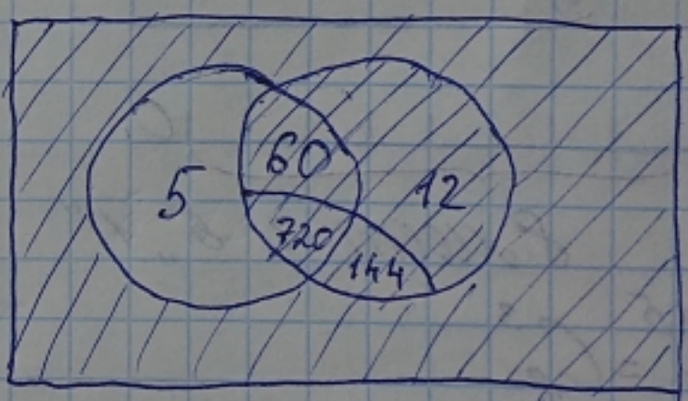
{12} - 25

{5} - 53

{144} - 9

{60} - 10

{720} - 5



$(\overline{\{5\}} \vee \{12\}) - ?$

53 - 10 = 43

90 - 43 = 47

Ответ: 47

6. $2015 = 1007 \cdot 2 + 1$
$1007 = 335 \cdot 3 + 2$
$335 = 83 \cdot 4 + 3$
$83 = 16 \cdot 5 + 3$
$16 = 2 \cdot 6 + 1$
$2 = 0 \cdot 7 + 2$

$2015_{10} = (2133321)_?$

2	7654321	3
4	765421	6
3	75421	5
3	7421	7
2	421	4
1	21	2
0	1	1

Ответ: 3657421

7. а) $x_1\ x_2\ x_3\ x_4\ x_5$ $\quad x_i \in [0; 13]$

$x_1 + x_2 - 8 = x_3 + x_4 + x_5$

1) $\begin{cases} x_i = 13 - a_i, & i \le 2 \\ x_i = a_i, & i > 2 \end{cases}$

$13 - a_1 + 13 - a_2 - 8 = a_3 + a_4 + a_5$

$a_1 + \ldots + a_5 = 18$

$N = 18$

2) $\begin{cases} x_i = a_i, \ i \le 2 \\ x_i = 13 - a_i, \ i > 2 \end{cases}$

$a_1 + a_2 - 8 = 13 - a_3 + 13 - a_4 + 13 - a_5$

$a_1 + \ldots + a_5 = 29 + 8 = 47$

$N = 47$

Ответ: $N = 18$ или $N = 47$

б) I. 1) $C_{18+5-1}^{5-1} = C_{22}^{4}$ | $a_1 + \ldots + a_5 = 18$

$a_i \ge 0$

2) $a_1 > 13$

$a_1' = a_1 - 13$

$a_1 - 13 + a_2 + \ldots + a_5 = 18 - 13$

$a_1' + a_2 + \ldots + a_5 = 5$

$C_{5+5-1}^{5-1} = C_9^4$

II. $(1 + x + x^2 + \ldots + x^{13})^5 = \ldots + b_{18} x^{18} + \ldots$

$x^{18} = x^{y_1} \cdot x^{y_2} \cdot \ldots \cdot x^{y_5} = x^{y_1 + \ldots + y_5} \Rightarrow$

$\Rightarrow 18 = y_1 + \ldots + y_5$

$S = 1 + x + x^2 + \ldots + x^{13}$

$xS = x + x^2 + \ldots + x^{14}$

$xS - S = x^{14} - 1$

$S(x-1) = x^{14} - 1$

$S = \frac{x^{14}-1}{x-1} = \frac{1-x^{14}}{1-x}$

$\frac{1}{1-x} = 1 + x + x^2 + \ldots + x^n + \ldots$

$f = (1+x+x^2+\ldots+x^{13})^5 = \left(\frac{1-x^{14}}{1-x}\right)^5 = \frac{(1-x^{14})^5}{(1-x)^5} =$

$= (1-x^{14})^5 (1+x+x^2+\ldots+x^n+\ldots)^5$

$(1-x^{14}) = (1 - C_5^1 x^{14} + \ldots)$

$(1+x+x^2+\ldots+x^n+\ldots)^5 = C_{22}^4 x^{18} + C_9^4 x^4$

$(1-x^{14})^5 (1+x+x^2+\ldots+x^n+\ldots)^5 = C_{22}^4 x^{18} - C_5^1 C_9^5 x^{18} = x^{18}(C_{22}^4 - 5C_9^4)$

Ответ: $C_{22}^4 - 5C_9^4$

8. К - К
Ж - К
К - Ж
} удовл. усл.

Ж - Ж $\quad P(Ж-Ж) = \frac{\cancel{13}}{\cancel{27}_9} \cdot \frac{\cancel{12}^4}{\cancel{26}_2} = \frac{Ж^2}{9 \cdot 2} = \frac{2}{9}$

$1 - \frac{2}{9} = \frac{7}{9}$

Ответ: $\frac{7}{9}$