23

Практичне завдання №2

Обчислити визначники другого порядку.

2.1 $\begin{vmatrix} -1 & 4 \\ -5 & 2 \end{vmatrix} = -2+20=18$

В. 18

2.2 $\begin{vmatrix} 3 & -4 \\ 1 & 2 \end{vmatrix} = \cancel{-4-6=-10}\ 6+4=10$

В. 10

2.3 $\begin{vmatrix} 3 & 6 \\ 5 & 10 \end{vmatrix} = 30-30=0$

В. 0

2.4 $\begin{vmatrix} ab & ac \\ bd & cd \end{vmatrix} = abcd - acbd = 0$

В. 0

2.5 $\begin{vmatrix} 1-\sqrt{2} & 2+\sqrt{3} \\ 2-\sqrt{3} & 1+\sqrt{2} \end{vmatrix} = \cancel{3-1=4}\ -1-1=-2$

В. -2

2.6 $\begin{vmatrix} a+b & a-b \\ a-b & a+b \end{vmatrix} = (a+b)^2-(a-b)^2 = a^2+2ab+b^2-a^2 +2ab-b^2 = 4ab$

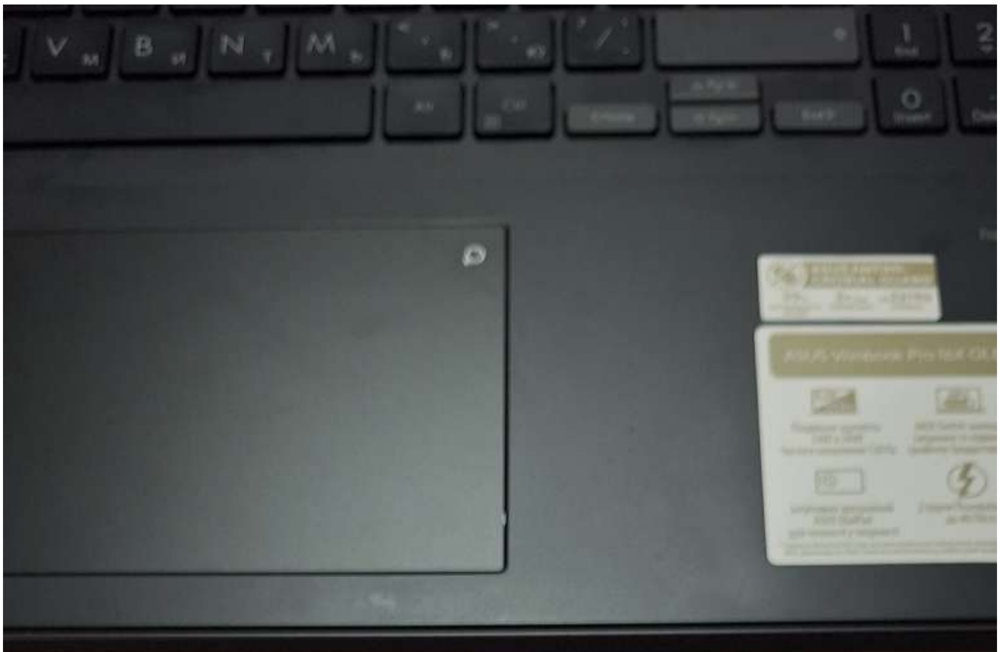
В. 4ab.

2.7 $\begin{vmatrix} \cos a & -\sin a \\ \sin a & \cos a \end{vmatrix} = \cos^2 a + \sin^2 a = 1$

В. 1

2.8 $\begin{vmatrix} -2 & \log_a b \\ \log_b a & -3 \end{vmatrix} = 6 - \frac{\log_a b}{\log_a b} = 5$

В. 5



2.9 $\begin{vmatrix} tg\alpha & -1 \\ 1 & ctg\alpha \end{vmatrix} = 1+1=2$

...дну: В. 2

Обчислити визначник третього порядку:

2.10 $\begin{vmatrix} 2 & 5 & 7 \\ 2 & 8 & 5 \\ 8 & 7 & 3 \end{vmatrix} = \overset{48}{2\cdot8\cdot3} + \overset{200}{5\cdot5\cdot8} + \overset{98}{2\cdot7\cdot7} - \overset{448}{7\cdot8\cdot8} - \overset{30}{5\cdot2\cdot3} -$

$- \overset{\cancel{105}\ 70}{7\cdot5\cdot2} = -202$

В. -202

2.11 $\begin{vmatrix} 1 & 2 & 5 \\ -3 & 1 & -1 \\ 2 & 0 & -2 \end{vmatrix} = -2+4+0-10-12-0 = \cancel{-20}\ -28$

В. -28

2.12 $\begin{vmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{vmatrix} = 45 + \overset{84}{2\cdot6\cdot7} + \overset{96}{4\cdot8\cdot3} - \overset{105}{7\cdot5\cdot3} - \overset{48}{8\cdot6\cdot1} - \overset{72}{4\cdot2\cdot9} =$

$= 225-105-48-72 = 0$

В. 0

2.13 $\begin{vmatrix} 3 & 4 & 5 \\ 8 & 7 & -2 \\ 2 & -1 & 8 \end{vmatrix} = \overset{168}{3\cdot7\cdot8} + \overset{-16}{4\cdot(-2)\cdot2} + \overset{-40}{8\cdot(-1)\cdot5} - \overset{70}{2\cdot7\cdot5} - \overset{6}{(-1)\cdot(-2)\cdot3} -$

$- \overset{256}{8\cdot4\cdot8} = -220$

В. -220

2.14 $\begin{vmatrix} \cancel{7} & \cancel{6} & \cancel{1} \\ \cancel{2} & \cancel{1} & \cancel{3} \\ 2 & 0 & -2 \end{vmatrix} =$

$\cancel{A_{12} = (-1)^{1+2} \cdot \begin{vmatrix} 3 & 1 \\ 2 & 3 \end{vmatrix} = -1\cdot 11 = 11}$ -8

$A_{22} = (-1)^{2+2} \cdot \begin{vmatrix} 3 & 1 \\ -2 & -2 \end{vmatrix} = 1\cdot(-8) = -8$

$= \cancel{11\cdot(-2) + 1\cdot4 + A_{32}\cdot0 = 26}$

$\cancel{11\cdot(-2) + (-8)\cdot1 + A_{32}\cdot0 =}$

$A_{12} = (-1)^{1+2} \cdot \begin{vmatrix} -2 & 3 \\ 2 & -2 \end{vmatrix} = 4-6 = 2$

$\underset{-4}{2\cdot(-2)} + \underset{-8}{(-8)\cdot1} + A_{32}\cdot0 = -12$

В. -12

2.15 $\begin{vmatrix} 1 & 2 & 0 \\ 0 & 1 & 3 \\ 5 & 0 & -1 \end{vmatrix} =$

$= 15 \cdot 2 + 1 \cdot (-1) + A_{32} \cdot 0 =$
$= 29$

В. 29

$A_{12} = (-1)^{1+2} \cdot \begin{vmatrix} 0 & 3 \\ 5 & -1 \end{vmatrix} =$
$= -1 \cdot (-15) = 15$

$A_{22} = (-1)^{2+2} \cdot \begin{vmatrix} 1 & 0 \\ 5 & -1 \end{vmatrix} =$
$= 1 \cdot (-1) = -1$

2.16 $\begin{vmatrix} 1 & -1 & 3 \\ -2 & 3 & 2 \\ 0 & 2 & 5 \end{vmatrix} =$

$= 11 \cdot 2 + (-2) \cdot 11 \pm A_{31} \cdot 0 =$
$= 0$

В. 0

$A_{11} = (-1)^{1+1} \cdot \begin{vmatrix} 3 & 2 \\ 2 & 5 \end{vmatrix} =$
$= 1 \cdot 11 = 11$

$A_{21} = (-1)^{2+1} \cdot \begin{vmatrix} -1 & 3 \\ 2 & 5 \end{vmatrix} = 11$

2.14 $\begin{vmatrix} 2 & 0 & 5 \\ 1 & 3 & 16 \\ 0 & -1 & 10 \end{vmatrix} =$

$= 2 \cdot 46 + (-5) \cdot 1 + A_{31} \cdot 0 =$
$= 87$

В. 87

$A_{11} = (-1)^{1+1} \cdot \begin{vmatrix} 3 & 16 \\ -1 & 10 \end{vmatrix} =$
$= 1 \cdot 46 = 46$

$A_{21} = (-1)^{2+1} \cdot \begin{vmatrix} 0 & 5 \\ -1 & 10 \end{vmatrix} =$
$= -1 \cdot 5 = -5$

2.18 $\begin{vmatrix} 1 & -1 & 4 \\ 0 & -2 & 3 \\ 0 & 2 & -4 \end{vmatrix} =$

$A_{11} = (-1)^{1+1} \cdot \begin{vmatrix} -2 & 3 \\ 2 & -4 \end{vmatrix} =$
$= 1 \cdot 2 = 2$

$= 2 \cdot 2 + A_{21} \cdot 0 + A_{31} \cdot 0 = 4$

В. 4

2.19 $\begin{vmatrix} 2 & -3 & -5 \\ 0 & -4 & 0 \\ 5 & -1 & 7 \end{vmatrix} = 2 \cdot (-28) + A_{21} \cdot 0 + 5 \cdot (20) =$
$= -156$

$A_{11} = (-1)^{1+1} \cdot \begin{vmatrix} -4 & 0 \\ -1 & 7 \end{vmatrix} =$
$= 1 \cdot (-28) = -28$

$A_{31} = (-1)^{3+1} \cdot \begin{vmatrix} -3 & -5 \\ -4 & 0 \end{vmatrix} = 1 \cdot 20 = -20$

В. -156.

2.20 $\begin{vmatrix} \cancel{-2} & \cancel{3} & \cancel{-4} \\ 4 & 0 & 5 \\ 7 & 0 & -6 \end{vmatrix} =$

$A_{12} = (-1)^{1+2} \cdot \begin{vmatrix} 4 & 5 \\ 7 & -6 \end{vmatrix} = -1 \cdot (-47) = 47$

$= \cancel{1 \cdot (-47) = 47}$ $\cancel{7 \cdot (-48) = 48}$ $\cancel{7 \cdot (-34) = 34}$

47

$= \cancel{47 \cdot (-3) + A_{22} \cdot 0 + A_{32} \cdot 0 = -231}$ $47 \cdot (-3) + A_{22} \cdot 0 + A_{32} \cdot 0 =$

$= -141$

В. -141.

2.21 $\begin{vmatrix} 1 & 1 & 1 \\ x & y & z \\ x^2 & y^2 & z^2 \end{vmatrix} = yz^2 + zx^2 + xy^2 - \cancel{yz}\, yx^2 - y^2z - xz^2 =$

$= yz^2 - xz^2 + zx^2 - yx^2 + xy^2 - y^2z = (y-x)(z-y)(z-x)$

2.22 $\begin{vmatrix} 2 & -1 & 1 & 0 \\ 0 & 1 & 2 & -1 \\ 3 & -1 & 2 & 3 \\ 3 & 1 & 6 & 1 \end{vmatrix} \begin{matrix} \\ \\ (-1) \\ +\text{III} \end{matrix} = \begin{vmatrix} \cancel{2 \;\; -1 \;\; 1 \;\; 0} \\ 0 \;\; 1 \;\; 2 \;\; -1 \\ \cancel{3 \;\; -1 \;\; 2 \;\; 3} \\ 0 \;\; 2 \;\; 4 \;\; -2 \end{vmatrix} = 2 \cdot 0 + 0 \cdot A_{21} + 3 \cdot 0 + 0 \cdot A_{41} =$

$A_{12} = (-1)^{1+1} \cdot \begin{vmatrix} 1 & 2 & -1 \\ -1 & 2 & 3 \\ 2 & 4 & -2 \end{vmatrix} = \cancel{0 \cdot 1 = 0}$ $0 \cdot 1 = 0$

$\cancel{2 + 0 + 6 + 2 - 18 + 12 = 0}$

$-4 + 12 + 4 + 4 - 12 - 4 = 0$

В. 0

$A_{31} = (-1)^{3+1} \cdot \begin{vmatrix} -1 & 1 & 0 \\ 1 & 2 & -1 \\ 2 & 4 & -2 \end{vmatrix} = 1 \cdot 0$

$4 - 2 + 0 - 0 - 4 + 2 = 0$

2.23 $\begin{vmatrix} 2 & 3 & -3 & 4 \\ 2 & 1 & -1 & 2 \\ 6 & 2 & 1 & 0 \\ 2 & 3 & 0 & -5 \end{vmatrix} +(\text{III}) = \begin{vmatrix} 2 & 3 & -3 & 4 \\ 8 & 3 & 0 & 2 \\ 6 & 2 & 1 & 0 \\ 2 & 3 & 0 & -5 \end{vmatrix} =$

$= -3 \cdot 38 + 162 = 48$

$A_{13} = (-1)^{1+3} \cdot \begin{vmatrix} 8 & 3 & 2 \\ 6 & 2 & 0 \\ 2 & 3 & -5 \end{vmatrix} = 1 \cdot \underbrace{8 \cdot 2 \cdot (-5)}_{-80} + 0 + \underbrace{6 \cdot 3 \cdot 2}_{36} - \underbrace{2 \cdot 2 \cdot 2}_{8} - 0 + \underbrace{6 \cdot 3 \cdot 5}_{90} =$

$= -80 + 36 - 8 + 90 = 38$

$A_{33} = (-1)^{3+3} \cdot \begin{vmatrix} 2 & 3 & 4 \\ 8 & 3 & 2 \\ 2 & 3 & -5 \end{vmatrix} = 1 \cdot \underbrace{2 \cdot 3 \cdot (-5)}_{-30} + \underbrace{3 \cdot 2 \cdot 2}_{12} + \underbrace{8 \cdot 3 \cdot 4}_{96} - \underbrace{2 \cdot 3 \cdot 4}_{24} - \underbrace{3 \cdot 2 \cdot 2}_{12} + \underbrace{8 \cdot 3 \cdot 5}_{120} =$

$= -30 + 12 + 96 - 24 - 12 + 120 = 162$

В. 48

2.24 $\begin{vmatrix} 1 & 1 & 1 & 1 \\ 1 & -1 & 2 & 2 \\ 1 & 1 & -1 & 3 \\ 1 & 1 & 1 & -1 \end{vmatrix} \begin{matrix} (-1) \\ +\text{I} \\ +\text{I} \\ +\text{I} \end{matrix} = \begin{vmatrix} 1 & 1 & 1 & 1 \\ 0 & -2 & 1 & 1 \\ 0 & 0 & -2 & 2 \\ 0 & 0 & 0 & -2 \end{vmatrix} = 1 \cdot (-8) + A_{21} \cdot 0 + A_{31} \cdot 0 + A_{41} \cdot 0 = -8$

$A_{11} = (-1)^{1+1} \cdot \begin{vmatrix} -2 & 1 & 1 \\ 0 & -2 & 2 \\ 0 & 0 & -2 \end{vmatrix} = 1 \cdot (-8) + 0 + 0 - 0 - 0 - 0 = -8$

В. -8

2.25 $\begin{vmatrix} 3 & -1 & 2 & -1 & 1 \\ 5 & 1 & -2 & 1 & 2 \\ 9 & -1 & 1 & 3 & 4 \\ 3 & 0 & 6 & -1 & 3 \\ 5 & 2 & 3 & -2 & 1 \end{vmatrix} \begin{matrix} \\ +\text{I} \\ +\text{II} \\ \\ \\ \end{matrix} = \begin{vmatrix} 3 & -1 & 2 & -1 & 1 \\ 8 & 0 & 0 & 0 & 3 \\ 14 & 0 & -1 & 4 & 6 \\ 3 & 0 & 6 & -1 & 3 \\ 5 & 2 & 3 & -2 & 1 \end{vmatrix} \begin{matrix} (\cdot 2) \\ \\ \\ \\ +\text{I} \end{matrix} =$

II

$\cancel{A_{12} = (-1)^{1+2}} \cdot \begin{vmatrix} 8 & 0 & 0 & 3 \\ 14 & -1 & 4 & 6 \\ 3 & 6 & -1 & 3 \\ 5 & 3 & -2 & 1 \end{vmatrix}$

$= \begin{vmatrix} \cancel{3} & \cancel{-1} & \cancel{2} & \cancel{-1} & \cancel{1} \\ 8 & 0 & 0 & 0 & 3 \\ 14 & 0 & -1 & 4 & 6 \\ 3 & 0 & 6 & -1 & 3 \\ 11 & 0 & 7 & -4 & 3 \end{vmatrix} = \cancel{18} - 1 \cdot (-465) = 465$

В. 465

$A_{12} = (-1)^{1+2} \cdot \begin{vmatrix} 8 & 0 & 0 & 3 \\ 14 & -1 & 4 & 6 \\ 3 & 6 & -1 & 3 \\ 11 & 7 & -4 & 3 \end{vmatrix} \begin{matrix} \\ \\ \\ +\text{II} \end{matrix} = -1 \cdot \begin{vmatrix} 8 & 0 & 0 & 3 \\ 25 & 6 & 0 & 9 \\ \cancel{3} & \cancel{6} & \cancel{-1} & \cancel{3} \\ 25 & 6 & 0 & 9 \end{vmatrix} = \cancel{-1} \cdot = \cancel{-1 \cdot (-18)} = 18$

$-1 \cdot 465 = -465$

$\cancel{25 \cdot 6 \cdot 3 \quad 432}$

$\cancel{432 \quad 0} + 6 \cdot 9 \cdot 8$

$\cancel{A_{33} = (-1)^{3+3}} \cdot \begin{vmatrix} 8 & 0 & 3 \\ 25 & 6 & 9 \\ 25 & 6 & 9 \end{vmatrix} = 1 \cdot 8 \cdot 6 \cdot 9 + \cancel{6 \cdot 9 \cdot 8 + 0} -$

$\underset{450}{25 \cdot 6 \cdot 3} - \underset{432}{6 \cdot 9 \cdot 8} - 0 = 18$

$= \cancel{8 \cdot 1 \cdot 8 \cdot 6 \cdot 9 + 25 \cdot 6 \cdot 3 + 0 - 25 \cdot 6 \cdot 3 - 6 \cdot 9 \cdot 8 \; 0 =}$

$\cancel{432} \quad \cancel{450} \quad 450 \quad \cancel{432}$

$\text{II} = \begin{vmatrix} 8 & 0 & 0 & 3 \\ \cancel{14} & \cancel{-1} & \cancel{4} & \cancel{6} \\ 3 & 6 & -1 & 3 \\ 25 & 6 & 0 & 9 \end{vmatrix} = 108 - 4 + 33 = 465$

$432 \quad 54 \quad 450 \quad 144$

$A_{23} = (-1)^{2+3} \cdot \begin{vmatrix} 8 & 0 & 3 \\ 3 & 6 & 3 \\ 25 & 6 & 9 \end{vmatrix} = -1 \cdot 8 \cdot 6 \cdot 9 + 0 + 3 \cdot 6 \cdot 3 - 25 \cdot 6 \cdot 3 - 6 \cdot 3 \cdot 8 -$

$- 0 = +108$

$252 \quad 75 \quad 288$

$A_{33} = (-1)^6 \cdot \begin{vmatrix} 8 & 0 & 3 \\ 14 & -1 & 6 \\ 25 & 6 & 9 \end{vmatrix} = 1 \cdot (-72) + 14 \cdot 6 \cdot 3 + 0 + 25 \cdot 3 - 6 \cdot 6 \cdot 8 - 0 =$

$= -33$

2.26 $\begin{vmatrix} 1 & 2 & 3 & 4 & -1 \\ 2 & 1 & -1 & 0 & 1 \\ 2 & 1 & 0 & 0 & 1 \\ 5 & 4 & 1 & 4 & 1 \\ 1 & 2 & 1 & 0 & 2 \end{vmatrix} \begin{matrix} \cdot(-1) \\ \\ \\ +(\mathrm{I}\cdot) \\ \\ \end{matrix} = \begin{vmatrix} \cancel{1} & \cancel{2} & \cancel{3} & \cancel{4} & \cancel{-1} \\ 2 & 1 & -1 & 0 & 1 \\ 2 & 1 & 0 & 0 & 1 \\ 4 & 2 & -2 & 0 & 2 \\ 1 & 2 & 1 & 0 & 2 \end{vmatrix} = 0 \cdot 4 = 0$

$A_{14} = (-1)^{1+4} \cdot \begin{vmatrix} 2 & 1 & -1 & 1 \\ 2 & 1 & 0 & 1 \\ 4 & 2 & -2 & 2 \\ 1 & 2 & 1 & 2 \end{vmatrix} \begin{matrix} \\ \\ +(\mathrm{I})\cdot 2 \\ +\mathrm{I} \end{matrix} = (-1)^{1+4} \cdot \begin{vmatrix} \cancel{2} & \cancel{1} & \cancel{-1} & \cancel{1} \\ 2 & 1 & 0 & 1 \\ 0 & 0 & 0 & 0 \\ 3 & 3 & 0 & 3 \end{vmatrix} =$

$= -1 \cdot 0 = 0$

$A_{13} = (-1)^{1+3} = 1 \cdot \begin{vmatrix} 2 & 1 & 1 \\ 0 & 0 & 0 \\ 3 & 3 & 3 \end{vmatrix} = 1 \cdot 0 + 0 + 0 - 0 - 0 - 0 =$

$= 0$

B. 0

2.27 $\begin{vmatrix} 1 & -1 & 2 & -2 & 3 \\ 0 & 1 & 3 & -1 & 2 \\ 4 & -2 & 1 & 3 & 1 \\ 0 & 5 & -1 & 1 & -4 \\ 5 & 3 & 5 & 1 & \ldots \end{vmatrix}$

$= 0$

$A_{11} = (-1)^{1+1} \cdot$

$= 1 \cdot (0 \cdot (-1) + \ldots$

$A_{13} = (-1)^{1+3}$

2.27 $\begin{vmatrix} 1 & -1 & 2 & -2 & 3 \\ 0 & 1 & 3 & -1 & 2 \\ 4 & -2 & 1 & 3 & 1 \\ 0 & 5 & -1 & 1 & -4 \\ 5 & 3 & 5 & 1 & 2 \end{vmatrix} \begin{matrix} \\ \\ +(I)\cdot(-4) \\ \\ +(I)\cdot(-5) \end{matrix} = \begin{vmatrix} 1 & -1 & 2 & -2 & 3 \\ 0 & 1 & 3 & -1 & 2 \\ 0 & 2 & -7 & 11 & -11 \\ 0 & 5 & -1 & 1 & -4 \\ 0 & 8 & -5 & 11 & -13 \end{vmatrix} =$

$= 0$

$A_{11} = (-1)^{1+1} \cdot \begin{vmatrix} 1 & 3 & -1 & 2 \\ 2 & -7 & 11 & -11 \\ 5 & -1 & 1 & -4 \\ 8 & -5 & 11 & -13 \end{vmatrix} \begin{matrix} \\ \\ +(I) \\ +(II)\cdot(-1) \end{matrix} = 1 \cdot \begin{vmatrix} \cancel{1} & \cancel{3} & \cancel{-1} & \cancel{2} \\ \cancel{2} & \cancel{-7} & \cancel{11} & \cancel{-11} \\ 6 & 2 & 0 & -2 \\ 6 & 2 & 0 & -2 \end{vmatrix} =$

$= 1 \cdot (0 \cdot (-1) + 11 \cdot 0) = 0$

$A_{13} = (-1)^{1+3} \cdot \begin{vmatrix} 2 & -7 & -11 \\ 6 & 2 & -2 \\ 6 & 2 & -2 \end{vmatrix} = 1 \cdot (-8) + \cancel{7 \cdot 2 \cdot 6} + \cancel{6 \cdot 2 \cdot 11} +$

$+ \cancel{11 \cdot 2 \cdot 6} + 8 - \cancel{6 \cdot 7 \cdot 2} = 0$

$A_{23} = (-1)^{2+3} \cdot \begin{vmatrix} 1 & 3 & 2 \\ 6 & 2 & -2 \\ 6 & 2 & -2 \end{vmatrix} = -1 \cdot (-4) + \cancel{3 \cdot 2 \cdot 6} + \cancel{6 \cdot 2 \cdot 2} - \cancel{2 \cdot 2 \cdot 6} +$

$+ \cancel{2 \cdot 2 \cdot 1} + \cancel{6 \cdot 3 \cdot 2} = 0$

В. 0

Розв'язати рівняння

2.28 $\begin{vmatrix} x & x+1 \\ -4 & x+1 \end{vmatrix} = 0$

$x^2 + x + 4x + 4 = 0$

$x^2 + 5x + 4 = 0$

$x_1 = -4 \quad x_2 = -1$

В. $x_1 = -4, \; x_2 = -1$

2.29 $\begin{vmatrix} 3 & x & -x \\ 2 & -1 & 3 \\ 10 & 1 & 1 \end{vmatrix} = 0$

$-3 + 30x - 2x - 10x - 9 - 2x = 0$

$16x - 12 = 0$

$16x = 12$

$x = \frac{\cancel{16}\,12}{\cancel{12}\,16} \quad x = \frac{3}{4}$

В. $x = \frac{3}{4}$

2.30 $\begin{vmatrix} x & x+1 & x+2 \\ x+3 & x+4 & x+5 \\ x+6 & x+7 & x+8 \end{vmatrix} = 0$

$x(x+4)(x+8) + (x+1)(x+5)(x+6) + (x+3)(x+7)(x+2) -$

$- \overset{x^2+4x}{\cancel{x+x}}(x+2)(x+4)(x+6) - (x+7)(x+5)(x) - (x+3)(x+1)(x+8)$

$= \cancel{x^3+8x+4x^2+32x+x^2+5x+x+5}\ 0$

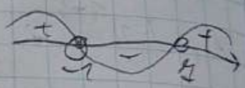
$x \in R$ В. $x \in R$

2.31 $\begin{vmatrix} x & 3x \\ 4 & 2x \end{vmatrix} < 14$

$2x^2 - 12x - 14 < 0 \quad |:2$

$x^2 - 6x - 7 < 0$

$(x-7)(x+1) < 0$



В. $x \in (-1; 7)$

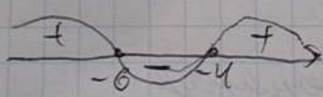
2.32 $\begin{vmatrix} 2 & x+2 & -1 \\ 1 & 1 & -2 \\ 5 & -3 & x \end{vmatrix} \geq 0$

$2x + 10x - 20 + 3 + 5 - 12 - x^2 - 2x \geq 0$

$-x^2 - 10x - 24 \geq 0 \quad |\cdot(-1)$

$x^2 + 10x + 24 \leq 0$

$(x+6)(x+4)$



В. $x \in [-6; -4]$

2.33 $\begin{vmatrix} 3 & -2 & 4 \\ 1 & x & -2 \\ -1 & 2 & -1 \end{vmatrix} < 0$

$-3x + 4 + 2 + x + 12 - 2 < 0$

$-2x + 8 < 0$

$-2x > -8$

$x > 4$

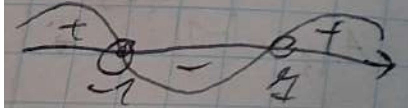
В. ~~$x \in (-\infty; 4)$~~ $x \in (4; +\infty)$

~~2-34~~

$= (x+3)(x+4)(x+2) -$

$+5)(x) - (x+3)(x+1)(x+8) =$

$0 \quad 1:2$



$3+5-12-x^2=2x$

≥ 0

Обчислити визначники n-го порядку:

2.34
$$\begin{array}{r} \\ (I)+ \\ (I)+ \\ (I)+ \\ (I)+ \end{array}\begin{vmatrix} 1 & 2 & 3 & \cdots & n \\ -1 & 0 & 3 & \cdots & n \\ -1 & -2 & 0 & \cdots & n \\ \vdots & \vdots & \vdots & \ddots & \vdots \\ -1 & -2 & -3 & \cdots & 0 \end{vmatrix} = \begin{vmatrix} 1 & 2 & 3 & \cdots & n \\ 0 & 2 & 6 & \cdots & 2n \\ 0 & 0 & 3 & \cdots & 2n \\ \vdots & \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & 0 & \cdots & n \end{vmatrix} = n!$$

В. $n!$

2.35
$$\begin{vmatrix} 3 & 2 & 2 & \cdots & 2 \\ 2 & 3 & 2 & \cdots & 2 \\ 2 & 2 & 3 & \cdots & 2 \\ \vdots & \vdots & \vdots & \ddots & \vdots \\ 2 & 2 & 2 & \cdots & 3 \end{vmatrix}$$

$A_1 |3| = \det A_1 = 3 \quad 2\cdot 1+1=3$

$A_2 \begin{vmatrix} 3 & 2 \\ 2 & 3 \end{vmatrix} = \cancel{\det A_2 =} 5 = 9-4=5 \quad 2\cdot 2+1=5$

$A_3 \begin{vmatrix} 3 & 2 & 2 \\ 2 & 3 & 2 \\ 2 & 2 & 3 \end{vmatrix} = 27+16-36=7 \quad , \quad 2\cdot 3+1=7$

$\parallel$

$A_n = 2n+1$

В. $2n+1$