(1)

$$\begin{vmatrix} 3 & 2 & 2 & \dots & 2 \\ 2 & 3 & 2 & \dots & 2 \\ 2 & 2 & 3 & \dots & 2 \\ \dots & & & & \\ 2 & 2 & 2 & \dots & 3 \end{vmatrix} \quad \begin{matrix} /i_{стр} - (i-1)_{стр}/ \\ = \end{matrix} \quad \begin{vmatrix} 1 & -1 & 0 & \dots & 0 \\ 0 & 1 & -1 & \dots & 0 \\ 0 & 0 & 1 & \dots & 0 \\ \dots & & & & \\ 2 & 2 & 2 & \dots & 3 \end{vmatrix};$$

(работаем с посл. строкой)

$$[2\ 2\ 2 \dots\ 3] \overset{-2I}{=}$$

$$= [0\ 4\ 2 \dots\ 3] \overset{-4II}{=}$$

$$= [\underbrace{0\ 0\ 6 \dots\ 3}_{n}] \Rightarrow \text{посл. з нач.} = \underline{2n+1}$$

$$\begin{vmatrix} 1 & -1 & 0 & \dots & 0 \\ 0 & 1 & -1 & \dots & 0 \\ \dots & & & & \\ 0 & 0 & 0 & \dots & 91 \end{vmatrix} = \underline{91}.$$

(2)

расширяем опред.

$$\begin{vmatrix} \alpha+\beta & \alpha\beta & 0 & \dots & 0 \\ 1 & \alpha+\beta & \alpha\beta & \dots & 0 \\ 0 & 1 & \alpha+\beta & \dots & 0 \\ \dots & & & & \\ 0 & 0 & 0 & \dots & \alpha+\beta \end{vmatrix} = (\alpha+\beta)\cdot \underbrace{\begin{vmatrix} \alpha+\beta & \alpha\beta & \dots & 0 \\ 1 & \alpha+\beta & \dots & 0 \\ \dots & & & \\ 0 & 0 & \dots & \alpha+\beta \end{vmatrix}}_{D_{n-1}} - 1\cdot \underbrace{\begin{vmatrix} \alpha\beta & 0 & \dots & 0 \\ 1 & \alpha+\beta & \dots & 0 \\ \dots & & & \\ 0 & 0 & \dots & \alpha+\beta \end{vmatrix}}_{\alpha\beta\cdot\begin{vmatrix} \alpha+\beta & \dots & 0 \\ \dots & & \\ 0 & \dots & \alpha+\beta \end{vmatrix} = \alpha\beta D_{n-2}} \Rightarrow$$

$$\Rightarrow D_n = (\alpha+\beta)D_{n-1} - \alpha\beta D_{n-2}$$

$$(n>2)$$

$$\Downarrow$$

$$D_{18} = \underline{1161737179}$$

(3)

$$\begin{vmatrix} -x & a & b & c \\ a & -x & c & b \\ b & c & -x & a \\ c & b & a & -x \end{vmatrix} = P_4(x).$$

. . .

(4)

$M[i][i] = N-1 + N \Rightarrow M'[i][i] = N-1$

$$\begin{vmatrix} 1 & 2 & 3 & 4 & 5 & \dots & n-1 & n \\ 1 & 3 & 3 & 4 & 5 & \dots & n-1 & n \\ \dots & & & & & & & \\ 1 & 2 & 3 & 4 & 5 & \dots & 2n-3 & n \\ 1 & 2 & 3 & 4 & 5 & \dots & n-1 & 2n-1 \end{vmatrix} = |a_1 \dots| + \cancel{|0 \dots|} = \cancel{|a_1 a_2 \dots|} + |a_1 1 \dots| =$$

$$= \cancel{|a_1 1 a_3 \dots|} + |a_1 1 2 \dots| = \dots =$$

$$= |a_1 1 \dots n-1| = \begin{vmatrix} 1 & 2 & 3 & 4 & 5 & \dots & n-1 & n \\ 0 & 1 & 0 & 0 & 0 & \dots & 0 & 0 \\ 0 & 0 & 2 & 0 & 0 & \dots & 0 & 0 \\ \dots & & & & & & & \\ 0 & 0 & 0 & 0 & 0 & \dots & 0 & n-1 \end{vmatrix} = (n-1)! \Rightarrow \underline{18!}$$