ДИСКРЕТНАЯ МАТЕМАТИКА 2019.
РУБЕЖНЫЙ КОНТРОЛЬ 1.

БИЛЕТ №1

Задание №5

$$\boldsymbol{a})\ X_{A\setminus(B\cup C)}=X_A(1-X_{B\cup C})=X_A(1-X_c-X_B+X_BX_C)$$
$$X_{(A\setminus B)\cap(A\setminus C)}=(X_A(1-X_B))(X_A(1-X_C))=(X_A-X_AX_B)(X_A-X_AX_C)=$$
$$=X_A^2(1-X_B)(1-X_C)=X_A(1-X_B)(1-X_C)=X_A(1-X_B-X_C+X_BX_C)$$

$$\boldsymbol{b})\ Док-ть:\ \ A\setminus(B\cup C)=(A\setminus B)\cap(A\setminus C)$$
$$A\setminus(B\cup C)=A\cap\overline{(B\cap C)}=A\cap(\bar B\cap\bar C)=(A\cap\bar B)\cap(A\cap\bar C)=(A\setminus B)\cap(A\setminus C)$$

Задание №6

$$S=([0;1],\max,\min)\qquad |0=0;1=1$$
$$\begin{cases}x_1=0.5x_1+0.2x_2+0.76x_3+0.35\\ x_2=0.6x_1+0.1x_2+0.7x_3+0.2\\ x_3=0.9x_1+0.8x_2+0.4x_3+0.9\end{cases}$$

$$\begin{cases}x_1=1\cdot(0.2x_2+0.76x_3+0.35)\\ x_2=0.6\cdot(0.2x_2+0.76x_3+0.35)+0.1x_2+0.7x_3+0.2=0.2x_2+0.6x_3+0.35+0.1x_2+0.7x_3+0.2=\\ \quad=0.2x_2+0.7x_3+0.35=x_2\Rightarrow \boldsymbol{x_2}=0.7x_3+0.35\\ x_3=0.9\cdot(0.2x_2+0.76x_3+0.35)+0.1\cdot(0.7x_3+0.35)+0.4x_3+0.9=0.2x_2+0.76x_3+0.35+0.1x_3+\\ +0.1+0.4x_3+0.9=0.2x_2+0.76x_3+0.9=0.2\cdot(0.7x_3+0.35)+0.76x_3+0.9=0.2x_3+0.2+0.76x_3+\\ +0.9=0.2x_3+0.2+0.76x_3+0.9=x_3=0.9\end{cases}$$

$$\begin{cases}x_1=0.2\cdot0.7+0.76\cdot0.9+0.35=0.2+0.76+0.35+0.76\\ x_2=0.7x_3+0.35=0.7+0.35=0.7\\ x_3=0.9\end{cases}$$

Задание №7

$$a\times b=c,\qquad S_7$$

$$a=\begin{pmatrix}1234567\\5627334\end{pmatrix}^{1997}\qquad b=\begin{pmatrix}1234567\\7162534\end{pmatrix}^{-2002}\qquad c(125)^{1999}$$
$$x=\alpha^{-1997}\cdot\beta^{-2002}\cdot\gamma^{1999}$$

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РУБЕЖНЫЙ КОНТРОЛЬ 1.

$\alpha=(15)(263)(47) \qquad |\alpha|=HOK(2,3,3)=6$
$\alpha^{-1997}=\alpha^{(-1997)\%6}=\alpha=(15)(263)(47)$

$\beta=(1742)(36)(5) \qquad |\beta|=HOK(4,2)=4$
$\beta^{-2002}=\beta^{(-2002)\%4}=\beta^2=(14)(27)(5)$

$\gamma=(125) \qquad |\gamma|=HOK(3)=3$
$\gamma^{1999}=\gamma^{1999\%3}=\gamma$

$x=(15)(263)(47)(14)(27)(5)(125)=\begin{pmatrix}1234567\\4125436\end{pmatrix}$

БИЛЕТ №2

Задание №5

Док-ть: $A\cap(B\setminus C)=(A\cap B)\setminus(A\cap C)$
$(A\cap B)\setminus(A\cap C)=(A\cap B)\cap\overline{(A\cap C)}=(A\cap B)\cap(\bar{A}\cap\bar{C})=(A\cap B\cap\bar{A})\cup(A\cap B\cap\bar{C})=$
$=(\varnothing\cap B)\cup(A\cap(B\cap\bar{C}))=\varnothing\cup(A\cap(B\setminus C))=A\cap(B\setminus C)$

Задание №6

$$Z_{11}\begin{cases}5x+7y-3z=8\\3x-6y+5z=2\\x-9y+z=-2\end{cases};\ \begin{cases}5(2y-z-2)+7y-3z=8\\3(2y-z-2)-6y+5z=2\\x=2y-z-2\end{cases}$$

$$\begin{cases}-1y-5z+1+7y-3z=8\\6y-3z-6-6y+5z=2\\x=2y-z-2\end{cases};\ \begin{cases}6y-8z=7\\2z=7\Rightarrow z=9\ (2\cdot9=18=7(\bmod 11))\\x=2y-z-2\end{cases}$$

$$\begin{cases}6\cdot y=8\cdot9-7=-1\cdot(-2)-7=3-7=3+4=7\\z=9\\2\cdot y-9-2=2\cdot y+0=2\cdot y\end{cases}$$

$$\begin{cases}6\cdot y=7\\z=9\\x=2\cdot y\end{cases}\Rightarrow\begin{cases}y=3\ (6\cdot3=18=7(\bmod 11))\\z=9\\x=2\cdot3=6\end{cases}$$