

$$\begin{array}{r}
 1) \quad \begin{array}{r} 12345678 \mid 16 \\ \hline 12345664 \mid 771604 \mid 16 \\ \hline 14 \quad 771600 \mid 48225 \mid 16 \\ \hline 9 \quad 48224 \mid 3014 \mid 16 \\ \hline 1 \quad 3008 \mid 188 \mid 16 \\ \hline 6 \quad 176 \mid 11 \\ \hline 12 \end{array}
 \end{array}$$

Order: BC614E

$$\begin{array}{r}
 1000000 \mid 16 \\
 \hline
 1000000 \mid 62500 \mid 16 \\
 \hline
 0 \quad 62496 \mid 3906 \mid 16 \\
 \hline
 4 \quad 3904 \mid 244 \mid 16 \\
 \hline
 2 \quad 240 \mid 15 \\
 \hline
 4
 \end{array}$$

Order: F4240

$$2) \quad 1000000_{16} = (1 \cdot 16^6) + (0 \cdot 16^5) + (0 \cdot 16^4) + (0 \cdot 16^3) + (10 \cdot 16^2) + (0 \cdot 16^1) + (0 \cdot 16^0) = \underline{16777216}$$

$$\begin{aligned}
 12345678_{16} &= (1 \cdot 16^7) + (2 \cdot 16^6) + (3 \cdot 16^5) + \\
 &+ (4 \cdot 16^4) + (5 \cdot 16^3) + (6 \cdot 16^2) + (7 \cdot 16^1) + \\
 &+ (8 \cdot 16^0) = \underline{305415896}
 \end{aligned}$$

3) "Существенно ^Aмалока и ^Bмеха
и можно ^Cбу хлеба"
 $A \& B \& !C$

4) $A \rightarrow B = !A \vee B$

A	B	$A \rightarrow B$
0	0	1
0	1	1
1	0	0
1	1	1

\equiv

A	B	$!A$	$!A \vee B$
0	0	1	1
0	1	1	1
1	0	0	0
1	1	0	1

$A \leftrightarrow B = \underline{(A \& B)} \vee \underline{(!A \& !B)}$

\swarrow

A	B	$A \& B$
0	0	0
0	1	0
1	0	0
1	1	1

\downarrow

$!A$	$!B$	$!A \& !B$
1	1	1
1	0	0
0	1	0
0	0	0

$A \&\& B$	$!A \&\& !B$	$(A \&\& B) \vee (!A \&\& !B)$	$A \leftrightarrow B$
0	1	1	1
0	0	0	0
0	0	0	0
1	0	1	1

5) Main solution \oplus

$$A \oplus B = (!A \&\& B) \vee (A \&\& !B)$$

A	B	$!A \&\& B$	$A \&\& !B$	$A \oplus B$
0	0	0	0	0
0	1	1	0	1
1	0	0	1	1
1	1	0	0	0

- XOR

6) ~~$(B \rightarrow A) \cdot (A + B) \cdot (A \rightarrow C)$~~

$$X = (B \rightarrow A) \cdot (A + B) \cdot (A \rightarrow C) =$$

$$= (!B + A) \cdot (!A \cdot !B) \cdot (!A + C) =$$

$$= (!B \cdot !A + A \cdot !A) \cdot !B (!A + C) =$$

$$= !B \cdot !A \cdot (!A + C) = \underline{\underline{!B \cdot !A}}$$