

ДЗ №8, вариант 2

A=1,4, B=0,017

1. Формат Ф1

$$A = (1.4)_{10} = (1,666666)_{16} = (0,1666666)_{16} \cdot 16^1$$

0	1	0	0	0	0	0	1	0	0	0	1	0	1	1	0
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$$B = (0.017)_{10} = (0,045A1D)_{16} = (0,45A1D)_{16} \cdot 16^{-1}$$

0	0	1	1	1	1	1	1	0	1	0	0	0	1	1	0
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$$X_C = X_A - X_B + d$$

$$d + P_C = \frac{P_A + d - P_B - d}{P_C} + d$$

$$X_C = 1 - (-1) + 64 = 66$$

$$P_C = 2$$

№ шага	Действие	Делимое	Частное
0	M_A $[-M_B]_{\text{доп}}$ R_0	<div>0 0 0 0 1 0 1 1 0</div> <div>1 1 0 1 1 1 0 1 0</div> <div>1 1 1 0 1 0 0 0 0</div>	<div>0 0 0 0 0 0 0 0 0</div> <div>0 0 0 0 0 0 0 0 0</div> <div>0 0 0 0 0 0 0 0 0</div>
1	$\leftarrow R_0$ $[-M_B]_{\text{доп}}$ R_1	<div>1 1 0 1 0 0 0 0 0</div> <div>0 0 1 0 0 0 1 1 0</div> <div>1 1 1 1 0 0 1 1 0</div>	<div>0 0 0 0 0 0 0 0 0</div> <div>0 0 0 0 0 0 0 0 0</div> <div>0 0 0 0 0 0 0 0 0</div>
2	$\leftarrow R_1$ M_B пр R_2	<div>1 1 1 0 0 1 1 0 0</div> <div>0 0 1 0 0 0 1 1 0</div> <div>0 0 0 0 1 0 0 1 0</div>	<div>0 0 0 0 0 0 0 0 0</div> <div>0 0 0 0 0 0 0 0 0</div> <div>0 0 0 0 0 0 0 0 1</div>
3	$\leftarrow R_2$ M_B пр R_3	<div>0 0 0 1 0 0 1 0 0</div> <div>1 1 0 1 1 1 0 1 0</div> <div>1 1 1 0 1 1 1 1 0</div>	<div>0 0 0 0 0 0 0 1 0</div> <div>0 0 0 0 0 0 0 1 0</div> <div>0 0 0 0 0 0 0 1 0</div>
4	$\leftarrow R_3$ $B_{\text{пр}}$ R_4	<div>1 1 0 1 1 1 1 0 0</div> <div>0 0 1 0 0 0 1 1 0</div> <div>0 0 0 0 0 0 0 1 0</div>	<div>0 0 0 0 0 1 0 0 0</div> <div>0 0 0 0 0 1 0 0 0</div> <div>0 0 0 0 0 1 0 0 1</div>
5	$\leftarrow R_4$ $[-M_B]_{\text{доп}}$	<div>0 0 0 0 0 0 1 0 0</div> <div>1 1 0 1 1 1 0 1 0</div>	<div>0 0 0 0 1 0 1 0 0</div>

	R_5	$\underline{1\ 1\ 0\ 1\ 1\ 1\ 1\ 1\ 0}$	$0\ 0\ 0\ 0\ 1\ 0\ 1\ \underline{0}$ ↑
6	$\leftarrow R_5$ M_B пр R_6	$1\ 0\ 1\ 1\ 1\ 1\ 1\ 0\ 0$ $0\ 0\ 1\ 0\ 0\ 0\ 1\ 1\ 0$ $\underline{1\ 1\ 1\ 0\ 0\ 0\ 0\ 1\ 0}$	$0\ 0\ 0\ 1\ 0\ 1\ 0\ 0\ 0$ $0\ 0\ 0\ 1\ 0\ 1\ 0\ \underline{0}$ ↑
7	$\leftarrow R_6$ M_B пр R_7	$1\ 1\ 0\ 0\ 0\ 0\ 1\ 0\ 0$ $0\ 0\ 1\ 0\ 0\ 0\ 1\ 1\ 0$ $\underline{1\ 1\ 1\ 0\ 0\ 1\ 0\ 1\ 0}$	$0\ 0\ 1\ 0\ 1\ 0\ 0\ 0\ 0$ $0\ 0\ 1\ 0\ 1\ 0\ 0\ \underline{0}$ ↑
8	$\leftarrow R_7$ M_B пр R_8	$1\ 1\ 0\ 0\ 1\ 0\ 1\ 0\ 0$ $0\ 0\ 1\ 0\ 0\ 0\ 1\ 1\ 0$ $\underline{1\ 1\ 1\ 0\ 1\ 1\ 0\ 1\ 0}$	$0\ 1\ 0\ 1\ 0\ 0\ 0\ 0\ 0$ $0\ 1\ 0\ 1\ 0\ 0\ 0\ \underline{0}$ ↑

$$C^* = (0,5)_{16} \cdot 16^2 = 80.$$

Определим абсолютную и относительную погрешности результата:

$$\Delta C = 82,35294118 - 80 = 2,35294118$$

$$\delta C = \left| \frac{2,35294118}{82,35294118} \right| \cdot 100\% = 2,85714286\%$$

2. Формат Ф2

$$A = (1.4)_{10} = (1,666666)_{16} = (0,1011001100110011)_2 \cdot 2^1$$

0	1	0	0	0	0	0	0	1	0	1	1	0	0	1	1
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

$$B = (0.017)_{10} = (0,045A1D)_{16} = (0,1000101101)_2 \cdot 2^{-5}$$

0	0	1	1	1	1	0	1	1	0	0	0	1	0	1	1
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

$$X_C = X_A - X_B + d$$

$$d + P_C = \frac{P_A + d - P_B - d}{P_C} + d$$

$$X_C = 1 - (-5) + 128 = 134$$

$$P_C = 6$$

№ шага	Действие	Делимое	Частное
	M_A	$0\ 1\ 0\ 1\ 1\ 0\ 0\ 1\ 1$	$0\ 0\ 0\ 0\ 0\ 0\ 0\ 0$

0	$[-M_B]_{\text{доп}}$ R_0	$\begin{array}{r} 1\ 0\ 1\ 1\ 1\ 0\ 1\ 0\ 1 \\ \textcolor{red}{0}\ 0\ 0\ 1\ 0\ 1\ 0\ 0\ 0 \end{array}$	$\begin{array}{r} 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ \textcolor{red}{1} \\ \uparrow \end{array}$
1	$\leftarrow R_0$ $[-M_B]_{\text{доп}}$ R_1	$\begin{array}{r} 0\ 0\ 1\ 0\ 1\ 0\ 0\ 0\ 0 \\ 1\ 0\ 1\ 1\ 1\ 0\ 1\ 0\ 1 \\ \textcolor{red}{1}\ 1\ 1\ 0\ 0\ 0\ 1\ 0\ 1 \end{array}$	$\begin{array}{r} 0\ 0\ 0\ 0\ 0\ 0\ 0\ 1\ 0 \\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 1\ \textcolor{red}{0} \\ \uparrow \end{array}$
2	$\leftarrow R_1$ M_B пр R_2	$\begin{array}{r} 1\ 1\ 0\ 0\ 0\ 1\ 0\ 1\ 0 \\ 0\ 1\ 0\ 0\ 0\ 1\ 0\ 1\ 1 \\ \textcolor{red}{0}\ 0\ 0\ 0\ 1\ 0\ 1\ 0\ 1 \end{array}$	$\begin{array}{r} 0\ 0\ 0\ 0\ 0\ 1\ 0\ 0\ 0 \\ 0\ 0\ 0\ 0\ 0\ 1\ 0\ \textcolor{red}{1} \\ \uparrow \end{array}$
3	$\leftarrow R_2$ M_B пр R_3	$\begin{array}{r} 0\ 0\ 0\ 1\ 0\ 1\ 0\ 1\ 0 \\ 1\ 0\ 1\ 1\ 1\ 0\ 1\ 0\ 1 \\ \textcolor{red}{1}\ 1\ 0\ 0\ 1\ 1\ 1\ 1\ 1 \end{array}$	$\begin{array}{r} 0\ 0\ 0\ 0\ 1\ 0\ 1\ 0\ 0 \\ 0\ 0\ 0\ 0\ 1\ 0\ 1\ \textcolor{red}{0} \\ \uparrow \end{array}$
4	$\leftarrow R_3$ $B_{\text{пр}}$ R_4	$\begin{array}{r} 1\ 0\ 0\ 1\ 1\ 1\ 1\ 1\ 0 \\ 0\ 1\ 0\ 0\ 0\ 1\ 0\ 1\ 1 \\ \textcolor{red}{1}\ 1\ 1\ 0\ 0\ 1\ 0\ 0\ 1 \end{array}$	$\begin{array}{r} 0\ 0\ 0\ 1\ 0\ 1\ 0\ 0\ 0 \\ 0\ 0\ 0\ 1\ 0\ 1\ 0\ \textcolor{red}{0} \\ \uparrow \end{array}$
5	$\leftarrow R_4$ $[-M_B]_{\text{доп}}$ R_5	$\begin{array}{r} 1\ 1\ 0\ 0\ 1\ 0\ 0\ 1\ 0 \\ 0\ 1\ 0\ 0\ 0\ 1\ 0\ 1\ 1 \\ \textcolor{red}{0}\ 0\ 0\ 0\ 1\ 1\ 1\ 0\ 1 \end{array}$	$\begin{array}{r} 0\ 0\ 1\ 0\ 1\ 0\ 0\ 0\ 0 \\ 0\ 0\ 1\ 0\ 1\ 0\ 0\ \textcolor{red}{1} \\ \uparrow \end{array}$
6	$\leftarrow R_5$ M_B пр R_6	$\begin{array}{r} 0\ 0\ 0\ 1\ 1\ 1\ 0\ 1\ 0 \\ 1\ 0\ 1\ 1\ 1\ 0\ 1\ 0\ 1 \\ \textcolor{red}{1}\ 1\ 0\ 1\ 0\ 1\ 1\ 1\ 1 \end{array}$	$\begin{array}{r} 0\ 1\ 0\ 1\ 0\ 0\ 1\ 0\ 0 \\ 0\ 1\ 0\ 1\ 0\ 0\ 1\ \textcolor{red}{0} \\ \uparrow \end{array}$
7	$\leftarrow R_6$ M_B пр R_7 $M_C \rightarrow$	$\begin{array}{r} 1\ 0\ 1\ 0\ 1\ 1\ 1\ 1\ 0 \\ 0\ 1\ 0\ 0\ 0\ 1\ 0\ 1\ 1 \\ \textcolor{red}{1}\ 1\ 1\ 1\ 0\ 1\ 0\ 0\ 1 \end{array}$	$\begin{array}{r} 1\ 0\ 1\ 0\ 0\ 1\ 0\ 0\ 0 \\ 1\ 0\ 1\ 0\ 0\ 1\ 0\ \textcolor{red}{0} \\ \uparrow \\ 0\ 1\ 0\ 1\ 0\ 0\ 1\ 0\ 0 \end{array}$

$$C^* = (0,101001)_2 \cdot 2^7 = 82.$$

Определим абсолютную и относительную погрешности результата:

$$\Delta C = 82,35294118 - 82 = 0,35294118$$

$$\delta C = \left| \frac{0,35294118}{82,35294118} \right| \cdot 100\% = 0,42857143\%$$

Погрешности результатов вызваны неточным представлением операндов. В формате Ф2 операнды представлены точнее и погрешность меньше.