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Группа Р3114

Вариант 22

Домашнее задание 8

$$A = 7.7$$

$$B = 0.028$$

1. Формат Ф1

$$A = (7.7)_{10} = (7.B33333)_{16} = (0,7B3333)_{16} \cdot 16^1$$

0	1	0	0	0	0	0	1	0	1	1	1	1	0	1	1
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$$B = (0.028)_{10} = (0,072B02)_{16} = (0,72B02)_{16} \cdot 16^{-1}$$

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

$$X_C = X_A - X_B + d$$

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

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

$$P_C = 2$$

N шага	Действие	Делимое	Частное
0	M_A	0 0 1 1 1 1 0 1 1	0 0 0 0 0 0 0 0 0
	$[-M_B]_{\text{доп}}$	1 1 0 0 0 1 1 0 1	
	R_0	0 0 0 0 0 1 0 0 0	$R_0 > 0$
	$M_A \rightarrow 4$	0 0 0 0 0 0 1 1 1	1 0 1 1 0 0 0 0
	$[-M_B]_{\text{доп}}$	1 1 0 0 0 1 1 0 1	
	R_0	1 1 0 0 1 0 1 0 0	1 0 1 1 0 0 0 0 0
1	$\leftarrow R_0$	1 0 0 1 0 1 0 0 1	0 1 1 0 0 0 0 0
	$[M_B]_{\text{пр}}$	0 0 1 1 1 0 0 1 1	
	R_1	1 1 0 0 1 1 1 0 0	0 1 1 0 0 0 0 0 0
2	$\leftarrow R_1$	1 0 0 1 1 1 0 0 0	1 1 0 0 0 0 0 0
	$[M_B]_{\text{пр}}$	0 0 1 1 1 0 0 1 1	
	R_2	1 1 0 1 0 1 0 1 1	1 1 0 0 0 0 0 0 0
3	$\leftarrow R_2$	1 0 1 0 1 0 1 1 1	1 0 0 0 0 0 0 0 0
	$[M_B]_{\text{пр}}$	0 0 1 1 1 0 0 1 1	
	R_3	1 1 1 0 0 1 0 1 0	1 0 0 0 0 0 0 0 0

4	$\leftarrow R_3$ $[M_B]_{\text{пр}}$ R_4	1 1 0 0 1 0 1 0 1 0 0 0 0 0 0 0 0 0 0 1 1 1 0 0 1 1 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 1
5	$\leftarrow R_4$ $[-M_B]_{\text{доп}}$ R_5	0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 1 0 1 1 0 0 0 1 1 0 1 1 1 0 0 1 1 1 0 1 0 0 0 0 0 0 1 0
6	$\leftarrow R_5$ $[M_B]_{\text{пр}}$ R_6	1 0 0 1 1 1 0 1 0 0 0 0 0 0 1 0 0 0 0 1 1 1 0 0 1 1 1 1 0 1 0 1 1 0 1 0 0 0 0 0 1 0 0
7	$\leftarrow R_6$ $[M_B]_{\text{пр}}$ R_7	1 0 1 0 1 1 0 1 0 0 0 0 0 1 0 0 0 0 0 1 1 1 0 0 1 1 1 1 1 0 0 1 1 0 1 0 0 0 0 1 0 0 0
8	$\leftarrow R_7$ $[M_B]_{\text{пр}}$ R_8	1 1 0 0 1 1 0 1 0 0 0 0 1 0 0 0 0 0 0 1 1 1 0 0 1 1 0 0 0 0 1 1 0 1 0 0 0 1 0 0 0 1

$$C^* = (0,11)_{16} \cdot 16^3 = 272.$$

Определим абсолютную и относительную погрешности результата:

$$\Delta C = 275 - 272 = 3$$

$$\delta C = \left| \frac{3}{275} \right| \cdot 100\% = 1,09090909\%$$

2. Формат Ф2

$$A = (7.7)_{10} = (7,B3333)_{16} = (0,1111011001100110011)_2 \cdot 2^3$$

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

$$B = (0.028)_{10} = (0,072B02)_{16} = (0,11100101011)_2 \cdot 2^{-5}$$

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

$$X_C = X_A - X_B + d$$

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

$$X_C = 3 - (-5) + 128 = 136$$

$$P_C = 8$$

N шага	Действие	Делимое	Частное
0	M_A $[-M_B]_{\text{доп}}$ R_0	0 1 1 1 1 0 1 1 0 1 0 0 0 1 1 0 1 1 0 0 0 1 0 0 0 1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 1
1	$\leftarrow R_0$ $[-M_B]_{\text{доп}}$ R_1	0 0 0 1 0 0 0 1 0 1 0 0 0 1 1 0 1 1 1 0 0 1 1 1 1 0 1	0 0 0 0 0 0 1 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 1 0
2	$\leftarrow R_1$ $[M_B]_{\text{пр}}$ R_2	0 0 1 1 1 1 0 1 0 0 1 1 1 0 0 1 0 1 1 0 1 0 1 1 1 1 1	0 0 0 0 0 1 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 1 0 0
3	$\leftarrow R_2$ $[M_B]_{\text{пр}}$ R_3	0 1 0 1 1 1 1 1 0 0 1 1 1 0 0 1 0 1 1 1 0 1 0 0 0 1 1	0 0 0 0 1 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 1 0 0 0
4	$\leftarrow R_3$ $[M_B]_{\text{пр}}$ R_4	1 0 1 0 0 0 1 1 0 0 1 1 1 0 0 1 0 1 0 0 0 1 0 1 0 1 1	0 0 0 1 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 1 0 0 0 1
5	$\leftarrow R_4$ $[-M_B]_{\text{доп}}$ R_5	0 0 1 0 1 0 1 1 0 1 0 0 0 1 1 0 1 1 1 0 1 1 1 0 0 0 1	0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0
6	$\leftarrow R_5$ $[M_B]_{\text{пр}}$ R_6	0 1 1 1 0 0 0 1 0 0 1 1 1 0 0 1 0 1 1 1 1 0 0 0 1 1 1	0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0
7	$\leftarrow R_6$ $[M_B]_{\text{пр}}$ R_7 $M_C \rightarrow$	1 1 0 0 0 1 1 1 0 0 1 1 1 0 0 1 0 1 0 0 1 1 1 0 0 1 1 0 1 0 0 0 1 0 0 1	1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 1 0 1 0 0 0 1 0 0 1

$$C^* = (0,10001001)_2 \cdot 2^9 = 274.$$

Определим абсолютную и относительную погрешности результата:

$$\Delta C = 275 - 274 = 1$$

$$\delta C = \left| \frac{1}{275} \right| \cdot 100\% = 0,36363636\%$$

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