

Домашнее задание № 7

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$$A = 8.5$$

$$B = 0.011$$

1. Формат Ф1

$$A = (8.5)_{10} = (8,8)_{16} = (0,88)_{16} \cdot 16^1$$

0 1 0 0 0 0 0 1 1 0 0 0 1 0 0 0 0 0 0

$$\mathbf{B} = (0.011)_{10} = (0,02\text{D}0\text{E}5)_{16} = (0,2\text{D}0\text{E}5)_{16} \cdot 16^{-1}$$

0	0	1	1	1	1	1	1	0	0	1	0	1	1	0	1	0	0	0	1
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$$\text{SignC} = \text{SignA} \oplus \text{SignB}.$$

$$X_A = P_A + d; X_B = P_B + d;$$

$$X_C = X_A + X_B - d;$$

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

$$\begin{array}{r} X_A = + \quad 1 \ 0 \ 0 \ 0 \ 0 \ 0 \ 1 \\ X_B = \quad \quad 0 \ 1 \ 1 \ 1 \ 1 \ 1 \ 1 \\ \hline X_A + X_B = \quad 1 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \\ d = - \quad \quad 1 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \\ \hline X_C = \quad \quad 1 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \end{array}$$

$$\mathbf{P}_C = \mathbf{0}$$

№	Операнды	СЧП (старшие разряды)																В/СЧП (младшие разряды)																Признак коррекции																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
0	СЧП	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	СЧП->2	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	1	1	0	1	
3	[M _A] _{пр}	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	M _A										
	СЧП	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	1	0	1	0
	СЧП->2	0	0	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1	1
4	[-M _A] _{доп}	1	1	1	0	1	1	1	1	0	0	0	0	0	0	0	-M _A										
	СЧП	1	1	1	1	0	0	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1	1
	СЧП->2	1	1	1	1	1	1	0	0	1	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0
5	[-M _A] _{доп}	1	1	1	0	1	1	1	1	0	0	0	0	0	0	0	-M _A										
	СЧП	1	1	1	0	1	0	1	1	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
	СЧП->2	1	1	1	1	1	0	1	0	1	1	1	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0
6	[M _A] _{пр}	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	M _A										
	СЧП	0	0	0	0	1	0	1	1	1	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	СЧП->2	0	0	0	0	0	0	1	0	1	1	1	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0
7	СЧП	0	0	0	0	0	0	1	0	1	1	1	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0
	M _C	0	0	0	0	0	0	1	0	1	1	1	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0

$$C^* = (0,17F)_{16} \cdot 160 = 0,09350586.$$

Определим абсолютную и относительную погрешности результата:

$$\Delta C = 0,0935 - 0,09350586 = -0,00000586$$

$$\delta C = \left| \frac{-0,00000586}{0,0935} \right| \cdot 100\% = 0,00626671\%$$

2. Формат Ф2

$$A = (8.5)_{10} = (8,8)_{16} = (0,10001)_2 \cdot 2^4$$

$$0 \quad 1 \quad 0 \quad 0 \quad 0 \quad 0 \quad 1 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 1 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$$

$$B = (0.011)_{10} = (0,02D0E5)_{16} = (0,1011010001)_2 \cdot 2^{-6}$$

$$0 \quad 1 \quad 1 \quad 1 \quad 1 \quad 0 \quad 1 \quad 0 \quad 1 \quad 1 \quad 0 \quad 1 \quad 0 \quad 0 \quad 0 \quad 1 \quad 0 \quad 0$$

$$\begin{array}{r} X_A = \quad 1 \quad 0 \quad 0 \quad 0 \quad 0 \quad 1 \quad 0 \quad 0 \\ X_B = \quad 0 \quad 1 \quad 1 \quad 1 \quad 1 \quad 0 \quad 1 \quad 0 \\ \hline X_A + X_B = 1 \quad 1 \quad 1 \quad 1 \quad 1 \quad 1 \quad 1 \quad 0 \\ d = \quad 1 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \\ \hline X_C = \quad 0 \quad 1 \quad 1 \quad 1 \quad 1 \quad 1 \quad 1 \quad 0 \end{array}$$

$$P_C = -2$$

№	Операнды	СЧП (старшие разряды)	В/СЧП (младшие разряды)	Признак коррекции
0	СЧП	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1 0 1 1 0 1 0 0 0 1 0 0	0
	[4M _A] _{пр}	0 0 0 1 0 0 0 1 0 0 0 0 0 0 0 0		
	[0M _A] _{пр}	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		
1	СЧП	0 0 0 1 0 0 0 1 0 0 0 0 0 0 0 0	1 0 1 1 0 1 0 0 0 1 0 0	0
	СЧП->4	0 0 0 0 0 0 0 1 0 0 0 1 0 0 0 0	0 0 0 0 1 0 1 1 0 1 0 0	
	[4M _A] _{пр}	0 0 0 1 0 0 0 1 0 0 0 0 0 0 0 0		
	[0M _A] _{пр}	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		
2	СЧП	0 0 0 1 0 0 1 0 0 0 0 1 0 0 0 0	0 0 0 0 1 0 1 1 0 1 0 0	1
	СЧП->4	0 0 0 0 0 0 0 1 0 0 1 0 0 0 0 1	0 0 0 0 0 0 0 0 0 0 1 0	
	[-M _A] _{доп}	1 1 1 1 1 0 1 1 1 1 0 0 0 0 0 0		
	[-4M _A] _{доп}	1 1 1 0 1 1 1 1 0 0 0 0 0 0 0 0		
3	СЧП	1 1 1 0 1 0 1 1 1 1 1 0 0 0 0 1	0 0 0 0 0 0 0 0 0 0 1 0	0
	СЧП->4	1 1 1 1 1 1 1 0 1 0 1 1 1 1 1 0	0 0 1 0 0 0 0 0 0 0 0 0	
	[M _A] _{пр}	0 0 0 0 0 1 0 0 0 1 0 0 0 0 0 0		
	СЧП	0 0 0 0 0 0 1 0 1 1 1 1 1 1 0 0	0 0 1 0 0 0 0 0 0 0 0 0	

$$X_C = X_C - 1$$

$$C^* = (0,101111111000)_2 \cdot 2^{-3} = 0,09350586.$$

Определим абсолютную и относительную погрешности результата:

$$\Delta C = 0,0935 - 0,09350586 = -0,00000586$$

$$\delta C = \left| \frac{-0,00000586}{0,0935} \right| \cdot 100\% = 0,00626671\%$$

Погрешности результатов вызваны неточным представлением операндов. В формате Ф1 и Ф2 операнды представлены одинаково точно.