

**Дискретная математика**  
**Домашнее задание №7**  
**«Умножение чисел с плавающей запятой»**  
**Вариант №59**  
**Выполнил: Бободжонов Комронджон (гр. Р3113)**

**Варианты задания**

<i>A</i>	<i>B</i>
8,3	0,044

**Ход работы**

**#1**

**1. Формат  $\Phi 1$**

$$A = (8,3)_{10} = (8,4(C))_{16} = (0,84(C))_{16} \cdot 16^1$$

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

$$B = (0,044)_{10} = (0,0B44)_{16} = (0,B44)_{16} \cdot 16^{-1}$$

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

**2. Формат  $\Phi 2$**

$$A = (8,3)_{10} = (1000,01001100110)_2 = (0,100001001100110)_2 \cdot 2^4$$

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

$$B = (0,044)_{10} = (0,00001011010)_2 = (0,1011010)_2 \cdot 2^{-4}$$

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

#2-5  
Ф1

$$\text{Sign}C = \text{Sign}A \oplus \text{Sign}B.$$

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

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

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

$$\begin{array}{r} X_A = 1000001 \\ X_B = 0111111 \\ \hline \end{array}$$

$$X_A + X_B = 10000000$$

$$d = 1000000$$

$$X_C = 1000000$$

$$P_C = 0.$$

N	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	1	0	1	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

$$C = (0,5D8)_{16} \cdot 16^0 = (0,5D8)_{16} = 0,365234375$$

Определим абсолютную и относительную погрешности результата:

$$\Delta C = 0,3652 - 0,365234375 = -0,000034375$$

$$\delta C = |\Delta C / 0,3652| \cdot 100\% = 0,009\%$$

## Ф2

$$X_A = 10000100$$

$$\underline{X_B^+ = 01111100}$$

$$X_A + X_B = 1.00000000$$

$$d = \underline{10000000}$$

$$X_C = 10000000$$

$$P_C = 0.$$

N	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	1 0 1 1 0 1 0 0 0 0 0 0	0
	0M <sub>A</sub>	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	+0M <sub>A</sub> +0M <sub>A</sub>	
	0M <sub>A</sub>	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		
1	СЧП	0 0 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 0 0 0	0
	СЧП →4	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 1 0 1 1 0 1 0 0	
	+4M <sub>A</sub>	0 0 0 1 0 0 0 0 1 0 0 1 1 0 0 0 0 0	+4M <sub>A</sub> +0M <sub>A</sub>	
	+0M <sub>A</sub>	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		
2	СЧП	0 0 0 1 0 0 0 0 1 0 0 1 1 0 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 0 0 1 0 0 1 1	0 0 0 0 0 0 0 0 1 0 1 1	
	-4M <sub>A</sub>	1 1 1 0 1 1 1 1 0 1 1 0 1 0 0 0 0 0	-4M <sub>A</sub> -M <sub>A</sub>	
	-M <sub>A</sub>	1 1 1 1 1 0 1 1 1 1 0 1 1 0 1 0 0 0		
3	СЧП	1 1 1 0 1 1 0 0 0 1 0 0 1 0 1 1 1	0 0 0 0 0 0 0 0 0 1 0 1 1	0
	СЧП →4	1 1 1 1 1 1 1 0 1 1 0 0 0 1 0 0 1	0 1 1 1 0 0 0 0 0 0 0 0	
4	+0M <sub>A</sub>	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	+0M <sub>A</sub> +M <sub>A</sub>	
	+M <sub>A</sub>	0 0 0 0 0 1 0 0 0 0 1 0 0 1 1 0 0 0	0 1 1 1 0 0 0 0 0 0 0 0	
	СЧП	0 0 0 0 0 0 1 0 1 1 1 0 1 0 1 0 1	0 1 1 1 0 0 0 0 0 0 0 0	
	M <sub>C</sub>	0 0 0 0 0 0 1 0 1 1 1 0 1 0 1 0 1	0 1 1 1 0 0 0 0 0 0 0 0	

$$C = (0,010111010101)_2 \cdot 2^0 = (0,010111010101)_2 = 0,364502$$

Определим абсолютную и относительную погрешности результата:

$$\Delta C = 0,3652 - 0,364502 = 0,000698$$

$$\delta C = (\Delta C / 0,3652) \cdot 100\% = 0,19\%$$