

**Дискретная математика**  
**Домашнее задание №7**  
**«Умножение чисел с плавающей запятой»**  
**Вариант №61**  
**Выполнил: Нодири Хисравхон (гр. Р3131)**

**Варианты задания**

<i>A</i>	<i>B</i>
8,8	0,028

**Ход работы**

**#1**

**1. Формат  $\Phi 1$**

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

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

$$B = (0,028)_{10} = (0,072B)_{16} = (0,72B)_{16} \cdot 16^{-1}$$

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

**2. Формат  $\Phi 2$**

$$A = (8,8)_{10} = (1000,11001100110)_2 = (0,100011001100110)_2 \cdot 2^4$$

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

$$B = (0,028)_{10} = (0.00000111001)_2 = (0,111001)_2 \cdot 2^{-5}$$

0	0	1	1	1	1	0	1	1	1	1	0	0	1	0	0	0	0	0	0
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## #2-5

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

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

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

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

$$P_C$$

$$\overset{\curvearrowright}{X_A} = 1000001$$

$$\overset{+}{X_B} = 0111111$$

$$X_A + X_B = \overset{\curvearrowright}{10000000}$$

$$d = 1000000$$

$$X_C = 1000000$$

$$P_C = 0.$$

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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

$$C = (0,412)_{16} \cdot 16^0 = (0,412)_{16} = 0.2544$$

Определим абсолютную и относительную погрешности результата:

$$\Delta C = 0,2464 - 0,2544 = 0,0008$$

$$\delta C = |\Delta C / 0,2464| \cdot 100\% = 3,2445\%$$

## Ф2

$$\begin{aligned}
 X_A &= 10000100 \\
 X_B &\stackrel{+}{=} 01111011 \\
 X_A + X_B &\equiv 11111111 \\
 d &= \underline{10000000} \\
 X_C &= 01111111 \\
 P_C &= -1.
 \end{aligned}$$

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

$$C = (0,111110101101)_2 \cdot 2^{-2} = (0,00111110101101)_2 = 0,2449$$

Определим абсолютную и относительную погрешности результата:

$$\Delta C = 0,2464 - 0,2449 = 0,0015$$

$$\delta C = (\Delta C / 0,2464) \cdot 100\% = 0,608\%$$

## #6

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