Вариант 109 => A = 1675; B = 0,929

## Пункт 1

a)

|  |  |
| --- | --- |
| 0001.0110 | 0111.0101 |

1 6 7 5

б)

|  |  |  |  |
| --- | --- | --- | --- |
| 0001.0001 | 0001.0110 | 0001.0111 | 0001.0101 |

1 6 7 5

## Пункт 2

A = (1675)­10 = (11010001011)2

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | 6 | | | | 8 | | | | B | | | |
| 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 1 |
| 15 |  |  |  |  |  |  |  |  |  |  |  |  |  | 1 | 0 |

[-A]пр = 1.000 0110 1000 1011 – прямой код,

[-A]об = 1.111 1001 0111 0100 – обратный код,

+ 1

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

[-A]доп = 1.111 1001 0111 0111

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| 15 | 14 |  |  |  |  |  |  |  |  |  |  |  |  | 1 | 0 |

## Пункт 3

***А*** = (1675)10 = (68B)16 = (0,68B)16 \* 163

Характеристика числа A:

XA = PA + 64 = (67)10 = (1000011)2

Представление числа *A* в формате Ф1 имеет вид

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | 6 | 8 | B | 0 | 0 | 0 |
| 0 | 100 | 0011 | 0110 | 1000 | 1011 | 0000 | 0000 | 0000 |
| 0 | 1 | 7 | 8 |  |  |  |  | 31 |

*B* = (0,929)10 = (0,EDD2F1A)16

Дополнительная цифра числа, равная (A)16 = (1010)2, содержит в старшем двоичном разряде еденицу и поэтому изменяет значения предыдущей цифры, равной (1)16 на (2)16, при округлении числа.

*B* = (0,EDD2F2)16 = (0,EDD2F2)16 \* 160

Характеристика числа *B:*

XB = PB + 64 = 0 + 64 = 64 = (1000000)2

Представление числа *B* в формате Ф1 имеет вид

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | E | D | D | 2 | F | 2 |
| 0 | 100 | 0000 | 1110 | 1101 | 1101 | 0010 | 1111 | 0010 |
| 0 | 1 | 7 | 8 |  |  |  |  | 31 |

## Пункт 4

*A* = (1675)10 = (68B)16 = (11010001011)2 = (0, 11010001011) \* 211

Характеристика числа *A*:

XA = PA + 128 = 11 + 128 = 139 = (10001011)2

Число *A* представляется в формате Ф2 в виде:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 0 | 10001011 | | 10100010110000000000000 | |
| 31 | 30 | 23 | 22 | 0 |

*B* = (0,929)10 = (0,EDD2F1A9FBE)16 = (0,EDD2F2)16 = (0,11101101110100101111001)2 \* 20

Характеристика числа *B*:

XB = PB + 128 = 120 = (1111000)2

Число *B* представляется в формате Ф2 в виде:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 0 | 1111000 | | 11011011101001011110010 | |
| 31 | 30 | 23 | 22 | 0 |

## Пункт 5

*A* = (1675)10 = (68B)16 = (11010001011)2 = (1,1010001011) \* 210

Характеристика числа *A*:

XA = PA + 127 = 10 + 127 = 137 = (10001001)2

Число *A* представляется в формате Ф2 в виде:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 0 | 10001001 | | 10100010110000000000000 | |
| 31 | 30 | 23 | 22 | 0 |

B = 0,929 = (0,EDD2F2)16 = (0,11101101110100101111001)2 = (1, 1101101110100101111001)2 \* 2-1

XB = PB + 127 = -1 + 127 = 126 = (01111101)2

Число *B* представляется в формате Ф2 в виде:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 0 | 01111101 | | 110110111000000000000000 | |
| 31 | 30 | 23 | 22 | 0 |

## Пункт 6

R = (41288000)16 ; S = (BFD70000)16

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 4 | | 1 | 2 | 8 | 8 | 0 | 0 | 0 |
| 0 | 100 | 0001 | 0010 | 1000 | 1000 | 0000 | 0000 | 0000 |
| 0 | 1 | 7 | 8 |  |  |  |  | 31 |

XY = 67 = 64 + 3

PY = XY -64 = 3

Y = -(0,288000)16 \* 163

Y = -(288,000)16

Y = -(3 \* 162 + 8 \* 161 + 8 \* 160) = -648,000

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| B | | F | D | 7 | 0 | 0 | 0 | 0 |
| 1 | 011 | 1111 | 1101 | 0111 | 0000 | 0000 | 0000 | 0000 |
| 0 | 0 | 7 | 8 |  |  |  |  | 31 |

Порядок числа Z:

PZ = XZ – 64 = 63 – 64 = -1

Значение числа Z:

Z = (0,D7)16 \* 16-1 = (0,0D7)16 = (0 \* 160 + 0 \* 16-1 + 13 \* 16-2 + 7 \* 16-3)10 = 0,05249023437510

## Пункт 7

V = (41288000)16 ; W = (BFD70000)16

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 4 | | 1 | 2 | | 8 | 8 | 0 | 0 | 0 |
| 0 | 100 | 0001 | 0 | 010 | 1000 | 1000 | 0000 | 0000 | 0000 |
| 31 | 30 |  | 23 | 22 |  |  |  |  | 0 |

PV = XV – 128 = 130 - 128 = 2

Значение числа V в нормальной форме:

V = -(0,101010001)2 \* 22= -(10,1010001)2 = -(21 + 2-1 + 2-3 2-7)10 ≈ -2,63310

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| B | | F | D | | 7 | 0 | 0 | 0 | 0 |
| 1 | 011 | 1111 | 1 | 101 | 0111 | 0000 | 0000 | 0000 | 0000 |
| 31 | 30 |  | 23 | 22 |  |  |  |  | 0 |

PW = XW - 128 = 127 – 128 = -1

W = (0,11010111)2 \* 2-1 = (0,011010111)2 ≈ 0,419910

## Пункт 8

***PT = XT*** – 127 = 130 – 127 = 3

T = -(1,01010001)2 \* 23 = -(1010,10001)2 = -(1·23+0·22+1·21+0·1+1·2-1 + 0·2-2+0·2-3+0·2-4+1·2-5) ≈ -10.53110

Порядок числа Q:

PQ = XQ – 127 = 127 – 127 = 0.

Значение числа Q:

Q = (1,1010111)2 \* 20 = ≈ 1.68010