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Problem	Operation	To Binary	Answer in Binary	Answer in Decimal
1	$91_{10} + C6_{16}$	$01011011_2 + 11000110_2$	100100001_2	289_{10}
2	$11_8 - 11_{10}$	$01001_2 - 01011_2$	11110_2 *(2's complement)*	-2_{10}
3	$12.3125_{10} + 0110_{I2Q2}$	$11000101_{U4Q4} + 0110_{U2Q2}$	11011101_{U4Q4}	13.8125_{10}
4	$5.75_{10} - 7.125_{10}$	$0101110_{U4Q3} - 0111001_{U4Q3}$	0011_{I1Q3}	-1.375_{10}
5	$9_{10} * 3_{10}$	$1001_2 * 0011_2$	11011_2	27_{10}
6	$-5_{10} * -6_{16}$	$1111\ 1011_2 *$ (sign extend) $1111\ 1010_2$	00011110_2	30_{10}
7	$9.5_{10} * 2.625_{10}$	$1001100_{U4Q3} * 10101_{U2Q3}$	110001111_{U5Q4}	24.9375_{10}
8	$-1.25_{10} * 3.5_{10}$	$111011_{I4Q2} * 001110_{I4Q2}$	1011101_{I4Q3}	-4.375_{10}

Scratch Work Below

0100l — 01011

01001 + 110100

2   01001 + 10101 ⟿ ∅

2

VII 01001
     10101   00001 ⟶ 00010
     11110 ⟶ -2

12.3125

3 1100.0101
  + 01.10
  1101.1101

13.8125

4   5.75 — 7.125

101.11 — 0111.001

0101.110 + 1001.110
+1001.110
11110.100

0000.011 + 1 = -1.011 ⟶ -1.375

9 . 3

1001 . 0011

1001
x 0011
1001
10010
11011 = 27

-5_{10} . -6_{16} $6_{16} = 0110_2$

S = 0101 -1 = 0100 S_2 = 0101

-S = 1011₂ -6_2 = 1010

1011
x 1010
0000
1011
0000
1000
10011110 = 0010001 +1 = 0010010 = -18
00110001 t = 00110000 =

NO

6

$5 = 0101$ $6 = 0110$
                    $-6 = 1001 + 1 = 1010$
$-5 = 1010 + 1 = 1011$

                    sign extended

```
  1011              1111 1011
x 1010            x 1111 1010
  0000            _____
 10110            1111 011
0 0 0 0 0 0              0
1011000          1111011
1101110         1111011
               11111011
              1111 1011
```
              `...... 0000 1110 = 30 (wow!)`

_____

7 $9.5_{10} \cdot 2.625_{10}$

$1001.100 \cdot 0010.101$

```
  1001.100        1001.100
x     0001      x 0010.101
_____       1001100
                      0
               1001100
                   0
              1001100
           _____
           11000.111100  = 24.9375
```

(8)

$-1.25 = -2 + .75 = -2 + \frac{1}{2} + \frac{1}{4}$

0010 2 1101 +1 = 1110.11

3.5 = 0011.1   0101
                     1011.101

1010

1110.11
X 0011.10

1110.11
X 00111.10
[grid of multiplication digits]
0001.1010

1110.11
0011.10
      0
11101 1
11 1 1 0
1 1 1 1 0 0
1100 1 .1010

1110 11
1101

1 1110 11
+1110110
10110001
+11101100
1100111010