256 128 64 32 16 8 4 2 1
256 16 1

**1)** $291_{10} = 0101\,1011_2$    $C6_{16} = 16 \cdot 12 + 6 = 198_{10} =$
        $0110\,0110_2$

$\phantom{+}0010\,1101\,1$
$+\ 0110\,0110$
$\overline{0100\,1000\,01_2}$    $|b0100100001|$
$256 + 32 + 1 = 289_{10}$    $\underline{10 \text{ bit signed int}}$

**2)** $11_8 = 9_{10} = b1001$    $11_{10} = b1011$

$\phantom{+}0|01001$    $10100$
$+\ 1|10101$    $b1\,0101$
$\overline{1|11110}$
$\phantom{1|}00001\ \Big\}\ -2_{10} = |b11110$
$\phantom{1|}00010$    $\underline{5 \text{ bit signed int}}$

**3)** $12.3125_{10} = 01100.0101$    $0110_{I_2Q_2} = 01.10 = 1.5$
        $001100.0101$
        $000001.1000$
$b\ 001100.1101 =$    $|01101.1101_{ISQ4}$
$8 + 4 + 1 + 1/2 + 1/4 + 1/16 = |13.8125_{10}$

**4)** $5.75_{10} = 0101.11_{I4Q2}$    $7.125_{10} = 0111.001_{I4Q3}$
$\phantom{+}0101.110$    $1000.110$
$+\ 1000.111$    $1000.111$
$\overline{1110.101}$
$\phantom{+}0001.010$    $|1110.101_{I4Q3}$
$\phantom{+}0001.011 = -1.375_{10}$    $\underline{\text{signed float}}$

**5)** $9_{10} = 1001$    $3_{10} = 0011$
$\phantom{+}1001$
$\underline{\phantom{+}0011}$
$\phantom{+}1001$
$\phantom{+}1\,0010$
$\phantom{+}11011$    $|b011011 = 27_{10}$
$16 + 8 + 2 + 1 = 27..$    $\underline{\text{signed int}}$

6) $-5_{10} = $ 
0101
1010
1011
‾‾‾‾

$-6_{16} = $
0110
1001
1010
‾‾‾‾

```
        1 1 1 1 1 0 1 0
        1 1 1 1 0 1 1
        1 1 1 1 1 0 1 0
        1 1 1 0 1 0 X
        · · · · · · O O X X
        1 1 0 1 0 X X X
        1 0 1 O X X X X
        0 1 0 X X X X X X
        0 X X X X X X X X
        ‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾
        0 0 0 1 1 1 1 0
```

$b\ 011110 = 30_{10}$
signed int

7) $9.5_{10} = 1001.1$    $2.625_{10} = 10.101$

```
0 0 0 1 0 0 1 . 1
0 0 0 1 0 . 1 0 1
‾‾‾‾‾‾‾‾‾‾‾‾‾‾
      1 0 0 1 1
  0 0 0 0 0 X
  1 0 0 1 1 X X
0 0 0 0 0 X X X
1 0 0 1 1 X X X X
‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾
0 1 1 0 0 0 . 1 1 1 1
```

$b\ 011000.1111 = .4$
$24.9375_{10}$

8) $-1.25_{10} = $
01.01
10.10
10.11

$3.5_{10} = 11.1$

```
1 1 1 1 0 . 1 1        0 0 0 0 0 1 1 . 1
0 0 0 0 0 1 1 . 1      1 1 1 1 1 0 . 1 1
‾‾‾‾‾‾‾‾‾‾‾‾‾‾        ‾‾‾‾‾‾‾‾‾‾‾‾‾‾
1 1 1 1 1 0 1 1              1 1 1
1 1 1 1 0 1 1 X            1 1 1 X
1 1 1 0 1 1 X X          0 0 0 X X
‾‾‾‾‾‾‾‾‾‾‾‾            1 1 1 X X X
0 0 0 1 1 . 1 0 1       1 1 1 X X X X
                       1 1 1 X X X X X
                       1 1 X X X X X X
                       1 X X X X X X X
                       ‾‾‾‾‾‾‾‾‾‾‾‾‾‾
                       1 1 0 1 1 . 1 0 1
```

$b\ 1011.101 = $
$-4.375_{10}$
signed float