

0.125_{10}

$$0.125_{10} \times 16 = 2.0$$

$$0.125_{10} = 0.2_{16}$$

$$0.2_{16} = 0.0010_2$$

$$0.0010$$

$$0.1 \times 2^{-2}$$

$$\begin{array}{r} 0.100 \ 0000 \mid 0000 \ 0000 \mid 0000 \ 0000 \\ 4 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad F \quad E \end{array}$$

$$\begin{array}{r} 0000 \ 0010 \\ 1111 \ 1101 \quad 1's \text{ comp} \\ + \quad 1 \quad 2's \text{ comp} \\ \hline 1111 \ 1110 = -2 \end{array}$$

$0.125_{10} = 400000FE \leftarrow \text{NASA format}$
or if rounded up
 $400001FE$

| sign | exponent | | | | | | |
|------|----------|---|----|------|------|------|------|
| 0 | 011 1110 | 0 | 00 | 0000 | 0000 | 0000 | 0000 |
| 3 | E | 0 | 0 | 0 | 0 | 0 | 0 |

$0.125_{10} = 3E000000 \leftarrow \text{IEEE 754 format}$

$$1.0 \times 2^{-3}$$

$$127 - 3 = 124$$

$$124_{10} = 01111100_2$$

0.3_{10}

$$0.3 \times 16 = 4.8$$

$$0.8 \times 16 = 12.8$$

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$$0.3_{10} = 0.4C_{16}$$

$$0.4C_{16} = 0.0100 \ 1100$$

$$0.0100 \ 1100$$

$$0.100 \ 1100 \times 2^{-1}$$

$$\begin{array}{r} 0.100 \ 1100 \mid 1100 \ 1100 \mid 1100 \ 1100 \mid 1111 \ 1111 \\ 4 \quad C \quad C \quad C \quad C \quad C \quad F \quad F \end{array}$$

$$\begin{array}{r} 0000 \ 0001 \\ 1111 \ 1110 \quad 1's \text{ comp} \\ + \quad 1 \quad 2's \text{ comp} \\ \hline = 1111 \ 1111 = -1 \end{array}$$

$0.3_{10} = 4CCCCCFF \text{ NASA format}$
or rounded up
 $4CCCCDFP$

$$0.0100 \ 1100$$

$$1.001100 \times 2^{-2}$$

$$127 - 2 = 125$$

$$125_{10} = 01111101_2$$

| sign | exponent | | | | | | |
|------|-----------|-----|------|------|------|------|------|
| 0 | 0111 1101 | 001 | 1001 | 1001 | 1001 | 1001 | 1010 |
| 3 | E | 9 | 9 | 9 | 9 | 9 | A |

add +1 to round up

$0.125_{10} = 3E99999A \text{ IEEE 754 format}$