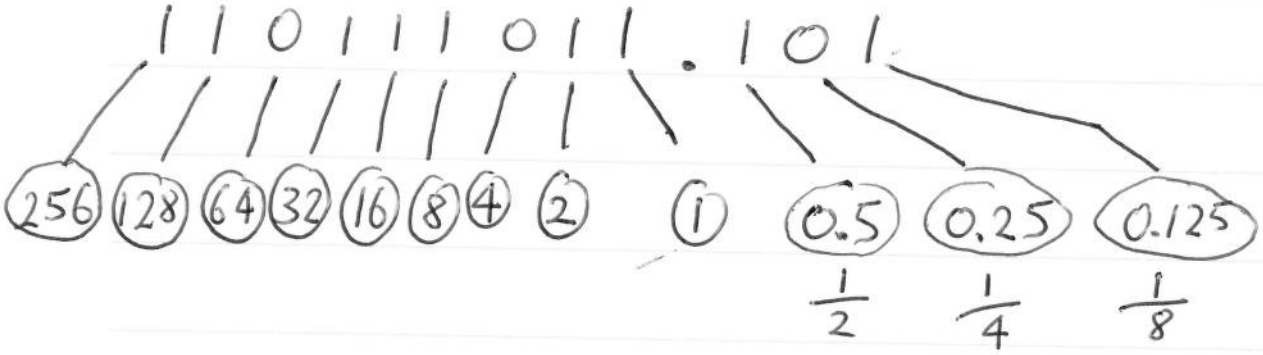
Example 1

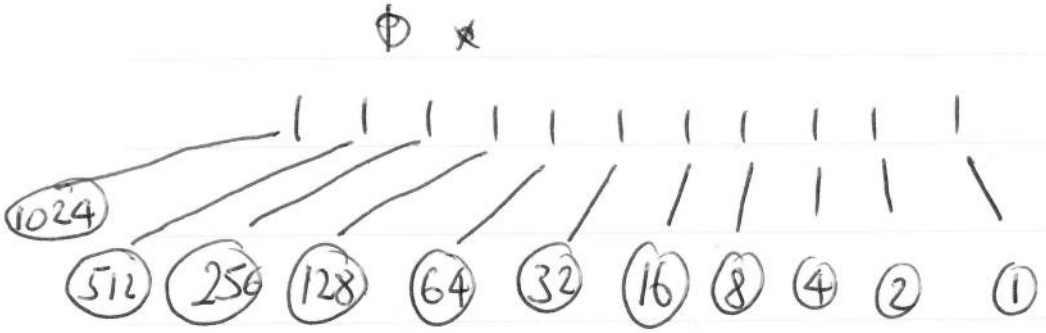
What decimal number is represented by the binary number 110111011.101_2 ?



1 x 1	=	1
1 x 2	=	2
0 x 4	=	0
1 x 8	=	8
1 x 16	=	16
1 x 32	=	32
0 x 64	=	0
1 x 128	=	128
1 x 256	=	256
1 x 0.5	=	0.5
0 x 0.25	=	0
1 x 0.125	=	0.125 +
		443.625_{10}

Ex. 2

What decimal number is represented by the binary number 11111111111_2 (ELEVEN 1's)



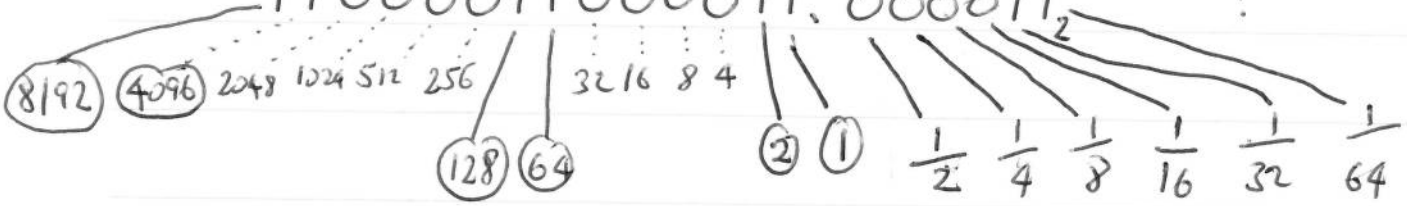
1 x 1	=	1
1 x 2	=	2
1 x 4	=	4
1 x 8	=	8
1 x 16	=	16
1 x 32	=	32
1 x 64	=	64
1 x 128	=	128
1 x 256	=	256
1 x 512	=	512
1 x 1024	=	1024 +
		2047

2047_{10}

Ex 3.

What decimal number is represented by the binary number

$1100001100000\,11.\,000011_2$?



1 x 1	=	1
1 x 2	=	2
1 x 64	=	64
1 x 128	=	~~4096~~ 128
1 x 4096	=	4096
1 x 8192	=	8192
1 x 0.03125	=	0.03125
1 x 0.015625	=	0.015625
		12483.046875

12483.046875_{10}

$\frac{1}{2} = 0.5$

$\frac{1}{4} = 0.25$

$\frac{1}{8} = 2\overline{)0.250} = 0.125$

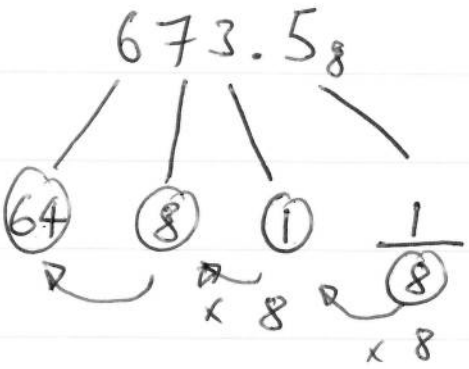
$\frac{1}{16} = 2\overline{)0.1250} = 0.0625$

$\frac{1}{32} = 2\overline{)0.06250} = 0.03125$

$\frac{1}{64} = 2\overline{)0.031250} = 0.015625$

Ex. 4

What decimal number is represented by the octal number 673.5_8



$5 \times 0.125 = 0.625$

$3 \times 1 = 3$

$7 \times 8 = 56$

$6 \times 64 = 384$ +

443.625

443.625_{10}

$\frac{1}{8} =$

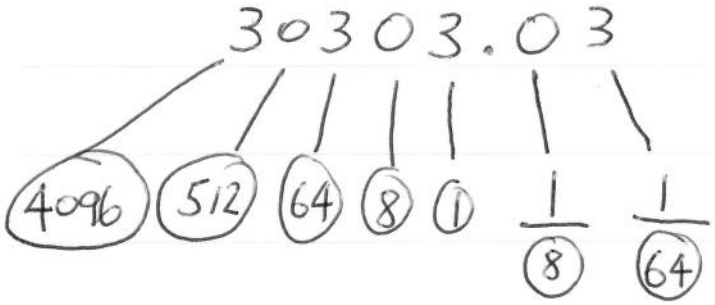
1 | 8

$$\begin{array}{r} {\scriptstyle 1\ 2\ 4} \\ 8\,\overline{)\,1.000} \\ 0.125 \end{array}$$

$$\begin{array}{r} {\scriptstyle 1\ 2} \\ 0.125 \\ \times\ \ 5 \\ \hline 0.625 \end{array}$$

Ex. 5

WHAT Decimal number is represented by the octal number 30303.03_8



$\frac{1}{8} = 0.125$

$\frac{1}{64} = \frac{0.125}{8}$

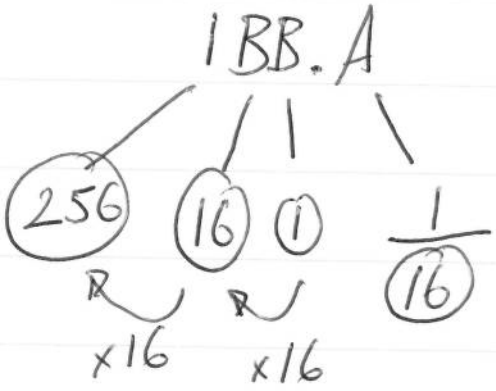
$$8 \overline{)0.125000} \quad (0.015625, \text{ remainders } 4, 5, 2, 4)$$

0.015625	3×0.015625	=	0.046875
3	0×0.125	=	0
0.046875	3×1	=	3
	0×8	=	0
4096	3×64	=	192
3	0×512	=	0
12288	3×4096	=	12288 +
			12483.046875

ANS = 12483.046875_{10}

Ex 6

What decimal number is represented by the hexadecimal number $1BB.A_{16}$



$A \times \frac{1}{16} = 10 \times 0.0625 = 0.625$

$B \times 1 = 11 \times 1 = 11$

$B \times 16 = 11 \times 16 = 176$

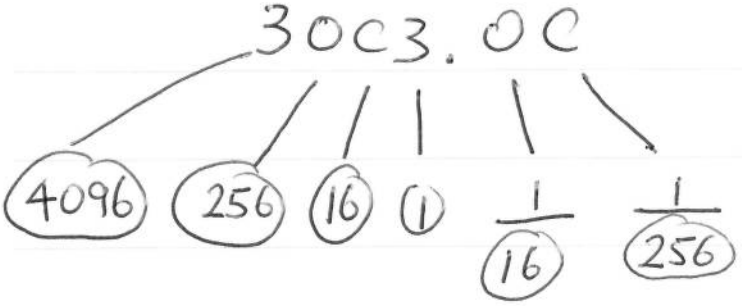
$1 \times 256 = 1 \times 256 = 256$ +

443.625

443.625_{10}

Ex. 7

What decimal number is represented by the hexadecimal number $30C3.0C_{16}$

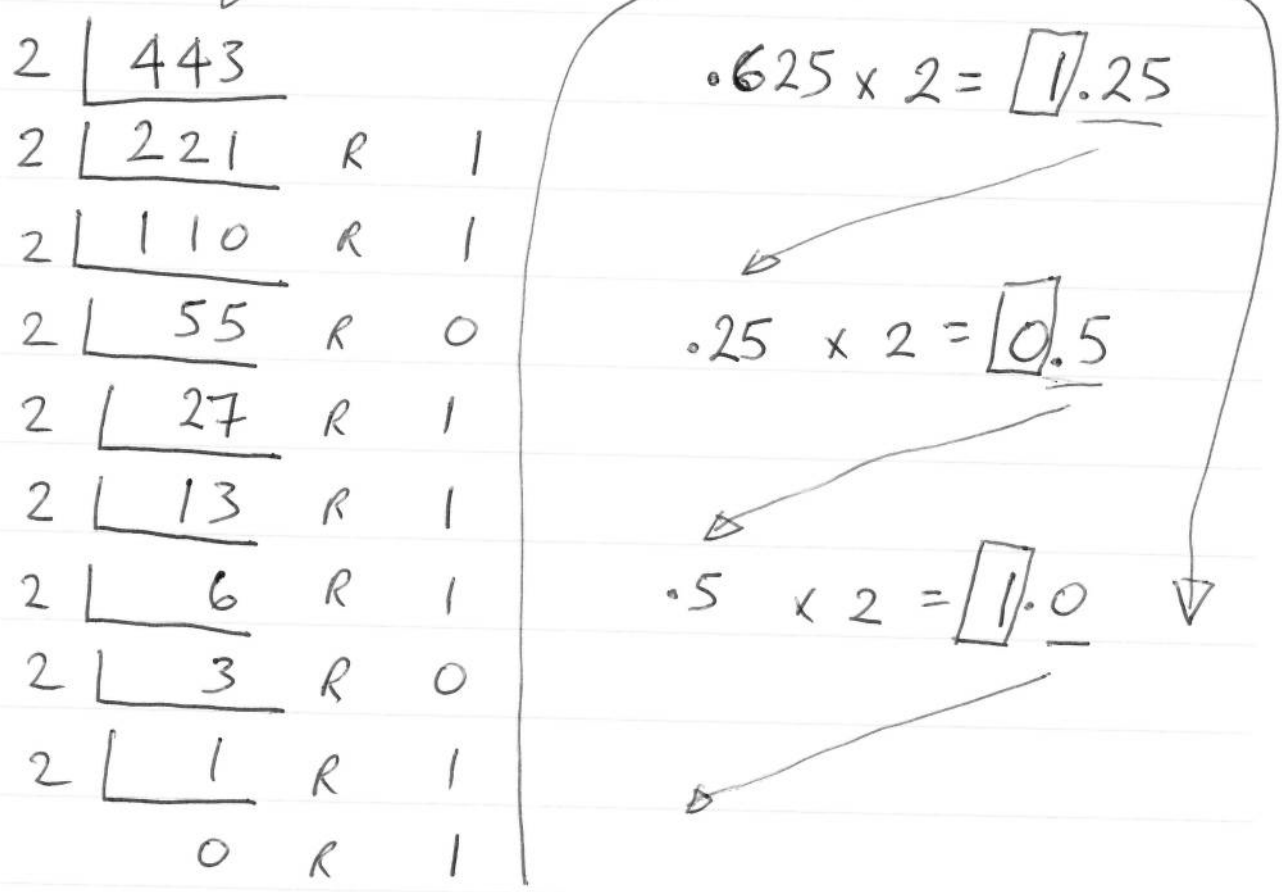


C x 0.00390625	= 12 x 0.00390625 =	0.04687
0 x 0.0625	= 0 x 0.0625 =	0
3 x 1	= 3 x 1	3
C x 16	= 12 x 16	192
0 x 256	= 0 x 256	0
3 x 4096	= 3 x 4096	12483
		12483.046875

12483.046875_{10}

Ex. 8

Convert the decimal no. 443.625_{10} to binary.



$$1\,1\,0\,1\,1\,1\,0\,1\,1.1\,0_2$$

EX9.

Convert the number 2047_{10} to binary.

2	2047		
2	1023	R	1
2	511	R	1
2	255	R	1
2	127	R	1
2	63	R	1
2	31	R	1
2	15	R	1
2	7	R	1
2	3	R	1
2	1	R	1
	0	R	1

ANS = 11111111111_2

(11)

DOUBLE THE PREVIOUS NO. AND EXPRESS YOUR ANSWER IN BINARY.

PREVIOUS NO. 1111111111111

DOUBLE " " 11111111111110

E.G.

$111_2 = 7_{10}$

DOUBLE IT $1110_2 = 14_{10}$

$11100_2 = 28_{10}$

$111000_2 = 56_{10}$