Convert the following decimal numbers into octal and hexadecimal

1. $165_{10} \rightarrow N_8$

Solution:

Successive/Repeated Division by Powers of Base (n) Method

	Quotient (Q)	Remainder (R)
165/64	**2**	37
37/8	**4**	5
5/1	**5**	0

8^3	8^2	8^1	8^0
512	64	8	1
0	**2**	**4**	**5**

Final answer is 245_8

Successive/Repeated Division by Base (n) Method

	Quotient (Q)	Remainder (R)
165/8	20	**5**
20/8	2	**4**
2/8	Cannot be	**2**

Final answer is 245_8

2. $165_{10} \rightarrow N_{16}$

Solution:

Successive/Repeated Division by Powers of Base (n) Method

	Quotient (Q)	Remainder (R)
165/16	**10 = A**	5
5/1	**5**	0

16^2	16^1	16^0
256	16	1
0	**10=A**	**5**

Final answer is $A5_{16}$

Successive/Repeated Division by Base (n) Method

	Quotient (Q)	Remainder (R)
165/16	10 = A	**5**
10/16	Cannot be	**A**

Final answer is $A5_{16}$

Convert the following octal and hexadecimal numbers to decimal number

1. $126_8 \rightarrow N_{10}$

Solution:

Multiply and Add Method:

Start with the leftmost digit

- **1** * 8 = 8
- 8 + **2** = 10
- 10 * 8 = 80
- 80 + **6** = **86_{10}**

Final answer is 86_{10}

Positional Value Method :

Start with the rightmost digit

		Step 1		Step 2
1 2 6	$6 * 8^0 =$	6 * 1 =		**6**
	$2 * 8^1 =$	2 * 8 =		**16**
	$1 * 8^2 =$	1 * 64 =		**64**
				86

Final answer is 86_{10}

2. $A34_{16} \rightarrow N_{10}$

Solution:

Multiply and Add Method:

Start with the leftmost digit

- **A** * 16 = 160
- 160 + **3** = 163
- 163 * 16 = 2608
- 2608 + **4** = **2612_{10}**

Final answer is 2612_{10}

Positional Value Method :

Start with the rightmost digit

		Step 1		Step 2
A 3 4	$4 * 16^0 =$	4 * 1 =		**4**
	$3 * 16^1 =$	3 * 16 =		**48**
	$A = 10 * 16^2 =$	A = 10 * 256 =		**2560**
				2612

Final answer is 2612_{10}

Convert the following binary numbers into octal and hexadecimal

1. $111000000001110_2 \rightarrow N_8$

Solution:

Group the bits into three´s starting from the right hand side

Group 5	Group 4	Group 3	Group 2	Group 1
111	000	000	001	110
421	421	421	421	421
4+2+1 = 7	**0**	**0**	**1**	**4+2 = 6**

Octal form

Final answer is 70016_8

2. $1111101011001110_2 \rightarrow N_{16}$

Solution:

Group the bits into four´s starting from the right hand side

Group 4	Group 3	Group 2	Group 1
1111	1010	1100	1110
8421	8421	8421	8421
8+4+2+1 = 15 = F	**8+2 = 10 = A**	**8+4 = 12 = C**	**8+4+2 = 14 = E**

Hexadecimal form

Final answer is $FACE_{16}$

Convert the following octal and hexadecimal numbers into binary

1. $765432_8 \rightarrow N_2$

Solution:

Step 1	7	6	5	4	3	2
	421	*421*	*421*	*421*	*421*	*421*
Step 2	**111**	**110**	**101**	**100**	**011**	**010**
Step 3	**111110101100011010_2**					Final Answer

2. $FACADE_{16} \rightarrow N_2$

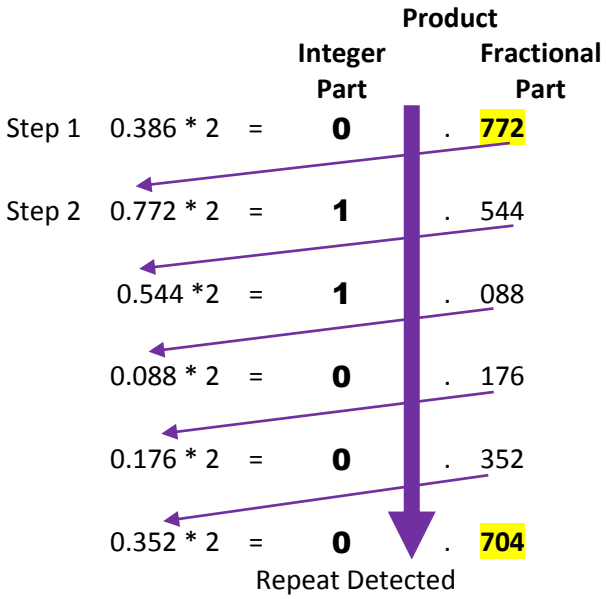
Solution:

Step 1	F	A	C	A	D	E
	8421	*8421*	*8421*	*8421*	*8421*	*8421*
Step 2	**1111**	**1010**	**1100**	**1010**	**1101**	**1110**
Step 3	**$111110101100101011011110_2$**					Final Answer

Convert the following into the specified base notation

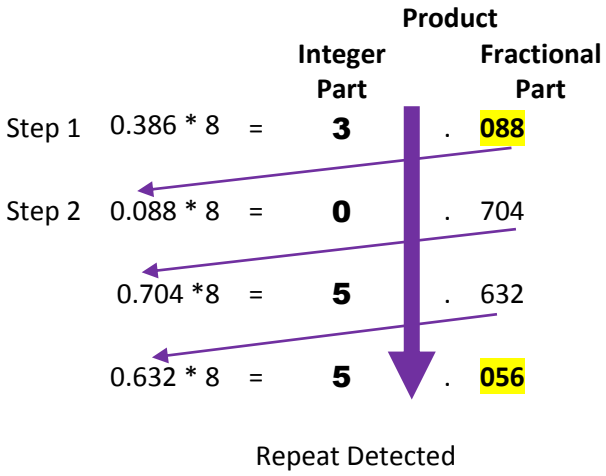
1. $0.386_{10} \rightarrow N_2$

Solution:



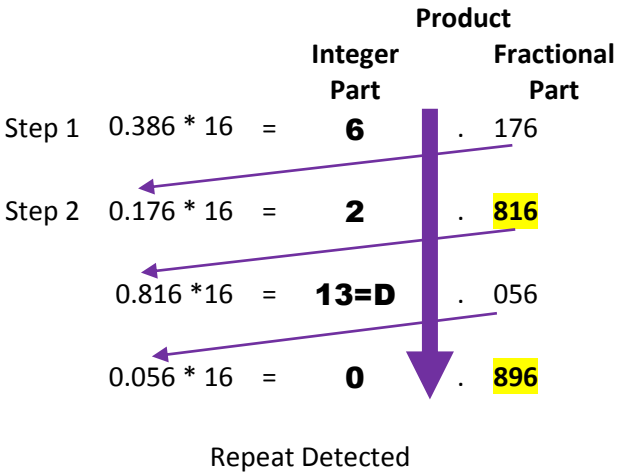
Final answer is $0.11000\ldots_2$ (approximately)

2. $0.386_{10} \rightarrow N_8$



Final answer is $0.3055\ldots_8$ (approximately)

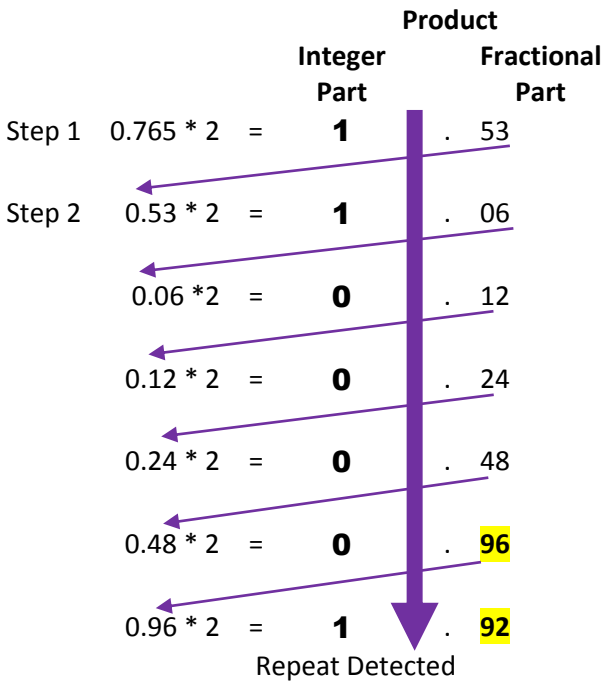
3. $0.386_{10} \rightarrow N_{16}$



Final answer is $0.62D0\ldots_{16}$ (approximately)

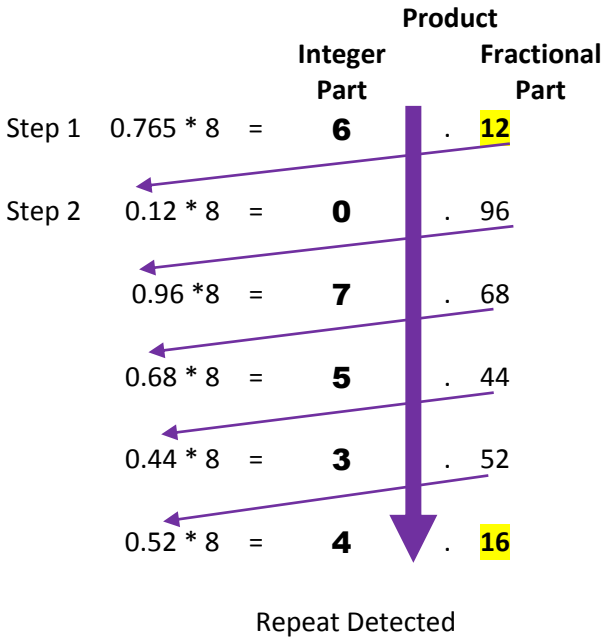
4. $0.765_{10} \rightarrow N_2$

Solution:



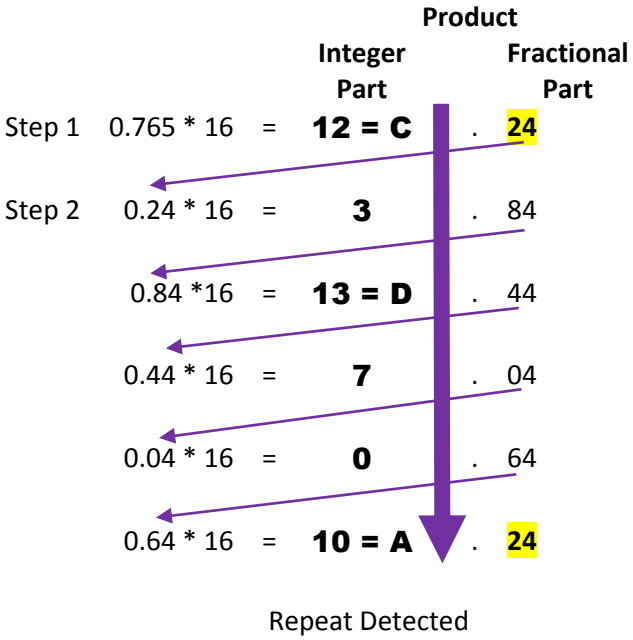
Final answer is $0.1100001\ldots_2$ (approximately)

5. $0.765_{10} \rightarrow N_8$



Final answer is $0.607534\ldots_8$ (approximately)

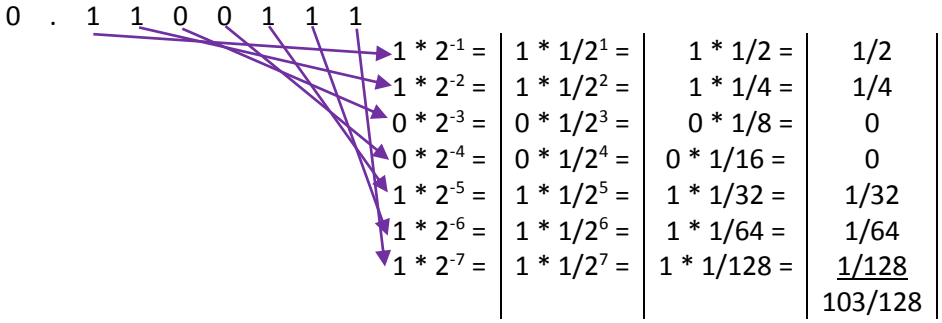
6. $0.765_{10} \rightarrow N_{16}$



Final answer is $0.C3D70A\ldots_{16}$ (approximately)

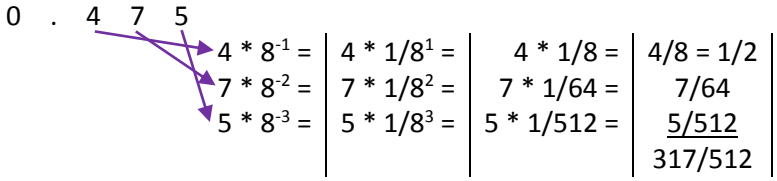
Convert the following fractional part into base 10 notation

1. $0.1100111_2 \rightarrow N_{10}$



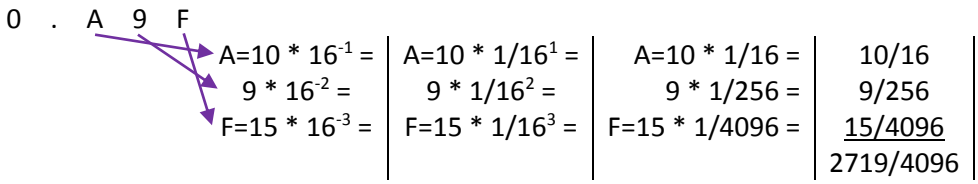
Final answer is 103/128 = 0.8046875_{10}

2. $0.475_8 \rightarrow N_{10}$



Final answer is 317/512 = 0.619140625_{10}

3. $0.A9F_{16} \rightarrow N_{10}$



Final answer is 2719/4096 = 0.663818359375_{10}