Please read 2a_number_systems.pdf if you have not yet done so.

After that, perform the following number conversions on your own:

1. convert 43 (decimal) to hexadecimal
2. convert 43 (decimal) to binary
3. convert A4 (hexadecimal) to decimal
4. convert A4 (hexadecimal) to binary
5. convert 10101111 (binary) to decimal
6. convert 10101111 (binary) to hexadecimal

If you are not sure how to carry out the above conversions, you may use this online tool:

https://www.mathportal.org/calculators/numbers-calculators/decimal-binary-hexadecimal-converter.php

It shows the steps and explains how it is done.

Example 1: convert 43 (decimal) to hexadecimal

Go to the next page for the answer:

$(43)_{10} = (2B)_{16}$

Explanation

Step 1:

Continually divide decimal number by 16 to give a result and a remainder. Write down the remainder (in hexadecimal).

In this example we have:

Division	Result	remainder (in dec)	remainder (in hex)
43 / 16	2	11	**B**
2 / 16	0	2	**2**

Step 2:

Read the remainders from bottom to top.

Example 2: convert 43 (decimal) to binary

Convert number 43 **from** Decimal **to** Binary

Answer:

$(43)_{10} = (101011)_2$

Explanation

Step 1:

Write down the decimal number and continually divide by 2 to give a result and a remainder. The remainder is either a **1** or a **0**.

In this example we have:

43	/ 2	result	21	remainder	**1**
21	/ 2	result	10	remainder	**1**
10	/ 2	result	5	remainder	**0**
5	/ 2	result	2	remainder	**1**
2	/ 2	result	1	remainder	**0**
1	/ 2	result	0	remainder	**1**

Step 2:

Read the remainders from bottom to top.

Example 3: convert A4 (hexadecimal) to decimal

Convert number	a4	from	Hexadecimal	to	Decimal

Answer:

$(A4)_{16} = (164)_{10}$

Explanation

Step 1:

Start at the rightmost digit. Convert that digit to decimal and multiply with 16^0 ($2^0 = 1$). Convert second digit to decimal and multiply with 16^1, third digit multiply with 16^2...

In this example we have:

HEX DIGIT	DEC VALUE	MULTIPLICATION	RESULT
4	4	$4 * 16^0$	4
A	10	$10 * 16^1$	160

Step 2:

Add together all products

4 + 160 = 164

Example 4: convert A4 (hexadecimal) to binary

Convert number	a4	from	Hexadecimal	to	Binary

Answer:

$(A4)_{16} = (10100100)_2$

Explanation

To convert a value from hexadecimal to binary, you translate each hexadecimal digit into its 4-bit binary equivalent as in the chart below.

0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111

In this example we have:

A	4
1010	**0100**

Example 5: convert 10101111 (binary) to decimal

Convert number	10101111	from	Binary	to	Decimal

Answer:

$(10101111)_2 = (175)_{10}$

Explanation

Step 1:

Start at the rightmost digit. Take that digit and multiply with 2^0 ($2^0 = 1$). Multiple second digit with 2^1, third with 2^2...

In this example we have:

1	*	2^0	=	1	* 1	=	1
1	*	2^1	=	1	* 2	=	2
1	*	2^2	=	1	* 4	=	4
1	*	2^3	=	1	* 8	=	8
0	*	2^4	=	0	* 16	=	0
1	*	2^5	=	1	* 32	=	32
0	*	2^6	=	0	* 64	=	0
1	*	2^7	=	1	* 128	=	128

Step 2:

Add together all products

1 + 2 + 4 + 8 + 0 + 32 + 0 + 128 = 175

Example 6: convert 10101111 (binary) to hexadecimal

Convert number **10101111** from **Binary** to **Hexadecimal**

Answer:

$(10101111)_2 = (AF)_{16}$

Explanation

Step 1:

Break the binary number into 'quartets'. In this example we have:

10101111 = 1010 1111

Step 2:

Use the table below to covert each quartet to its Hex equivalent.

0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F

In this example we have:

1010	1111
A	**F**

After these exercises, you should be confident to perform number conversions on your own.