

Convert the **base 10 real number** 117.78125 into

**A. Base 2** \_\_\_\_\_

**B. Base 8** \_\_\_\_\_

**C. Base 16** \_\_\_\_\_

2 | 117

2 | 58

2 | 29

2 | 14

2 | 7

2 | 3

2 | 1

2 | 0

1

0

1

0

1

1

1

.

.78125

x 2

1 .5625

x 2

1 .125

x 2

0 .250

x 2

0 .5

x 2

1 .000000000



1 1 1 0 1 0 1 . 1 1 0 0 1

Convert the **base 10 real number** 119.78125 into

A. Base 2 \_\_\_\_\_

	64	32	16	4	2	1	.5	.25	.03125			
0	1	1	1	0	1	1	0	1	1	0	0	0

1 6 5 . 6 2

B. Base 8 \_\_\_\_\_

C. Base 16 \_\_\_\_\_

Convert the **base 10 real number** 119.78125 into

A. Base 2 \_\_\_\_\_

	64	32	16		4	2	1		.5	.25			.03125			
0	1	1	1	0	1	0	1	.	1	1	0	0	1	0	0	0

B. Base 8 \_\_\_\_\_

7 5 . C 8

C. Base 16 \_\_\_\_\_

For the following 16 bit sequence:

**1 111 111 110 010 101**

**A.** What is the **base 10** value if the sequence is a **signed 2's complement 16 bit integer** ??

$$2 + 8 + 32 + 64 + 1 = -107$$

**B.** **Add** the following 2's complement 16 bit integer sequence to the sequence shown in part **A.** above, and express the answer as a **base 10 signed value**:

**0 000 000 001 001 101**

$$1 + 4 + 8 + 64 = +77 \quad -107 + 77 = -30$$

**1 111 111 110 010 101**

**0 000 000 001 001 101**

**1 111 111 111 100 010**

$$1 + 4 + 8 + 16 + 1 = -30$$

The following 2 byte sequence represents a C variable declared as:  
**unsigned short int var1;**  
 that is located in memory at bytes 3000 and 3001 as shown:

Mem adr	Bit content
3000	0 0 0 0 0 1 0 1
3001	1 0 0 0 0 1 0 1

- A. What is the **base 10** value if the sequence is found in a big endian machine ? **1413**
- B. What is the **base 10** value if the sequence is found in a little endian machine ? **34053**
- C. Assuming that **var1** from above is stored in a **little endian** machine  
**int var2 = var1;**

Mem adr	Bit content
6000	<b>0000 0101</b>
6001	<b>1000 0101</b>
6002	<b>0000 0000</b>
6003	<b>0000 0000</b>

For the **base 10** real number 101.21875

101

.

21875

2		<u>101</u>	
2		<u>50</u>	1
2		<u>25</u>	0
2		<u>12</u>	1
2		<u>6</u>	0
2		<u>3</u>	0
2		<u>1</u>	1
2		<u>0</u>	1

		.21875
		x2
0		.4375
		x2
0		.875
		x2
1		.75
		x2
1		.5
		x2
1		.0

0 1 1 0 0 1 0 1 . 0 0 1 1 1

