HOMEWORK 1. NUMBERS (1/1 point)

Which of the following is a correct result from the addition of the unsigned binary numbers 0111 and 1100?

- 0011
- 1011
- 010011 ✔
- 100011

EXPLANATION

```
 11
  0111
+ 1100
 10011
```

010011 is the same number as 10011 in unsigned binary.

Final Check | **Save** | Hide Answer *You have used 1 of 2 submissions*

HOMEWORK 2. NUMBERS

Consider a trinary (Base 3) number system with *trit* (*trinary digit*) positions.

HOMEWORK 2 A. NUMBERS (1/1 point)

How many numbers can be represented with four trit positions?

- 12
- 27
- 81 ✔
- 280

EXPLANATION

$3^4 = 81$ numbers.

Final Check | **Save** | Hide Answer *You have used 1 of 2 submissions*

HOMEWORK 2 B. NUMBERS (1/1 point)

What is the decimal value of the trinary number 1212?

- (•) 50 ✔
- ( ) 73
- ( ) 145
- ( ) 321

Help

EXPLANATION

$1 \times 3^3 + 2 \times 3^2 + 1 \times 3^1 + 2 \times 3^0 = 27 + 18 + 3 + 2 = 50.$

Final Check | **Save** | Hide Answer *You have used 1 of 2 submissions*

HOMEWORK 2 C. NUMBERS (1/1 point)

What is the trinary value of the decimal number 29?

- (•) 1002 ✔
- ( ) 1010
- ( ) 2015
- ( ) 2210

EXPLANATION

Can use either method 1 or 2 as in binary. Using method 1:

29/3 = 9 r2 trit0

9/3 = 3 r0 trit1

3/3 = 1 r0 trit2

1/3 = 0 r1 trit3

1002.

Final Check | **Save** | Hide Answer *You have used 1 of 2 submissions*

HOMEWORK 3. NUMBERS

In *fixed-point* number representation a certain number of digits are assumed to be to the right of the radix point. For example, the fixed point decimal number 23.45 has two digits to the right of the decimal point, and these vales 4 and 5 have weights 10^{-1} and 10^{-2}, respectively.

Now consider a fixed-point binary number with two digits to the right of the binary point.

HOMEWORK 3 A. NUMBERS (1/1 point)

What is the decimal value of the unsigned fixed-point binary number 10.11?

- -1.75
- -1.25
- 2.25
- 2.75 ✔

EXPLANATION

$2^1 + 2^{-1} + 2^{-2} = 2 + 0.5 + 0.25 = 2.75$.

Final Check | **Save** | Hide Answer *You have used 1 of 2 submissions*

HOMEWORK 3 B. NUMBERS (1/1 point)

What is the decimal value of the two's complement fixed-point binary number 1010.11?

- -5.75
- -5.25 ✔
- 12.25
- 12.75

EXPLANATION

$-(2^3) + 2^1 + 2^{-1} + 2^{-2} = -8 + 2 + 0.5 + 0.25 = -5.25$.

Final Check | **Save** | Hide Answer *You have used 1 of 2 submissions*

HOMEWORK 3 C. NUMBERS (1/1 point)

What is the two's complement fixed-point representation of decimal 6.25?

- 110.01
- 110.10
- 0110.01 ✔
- 0110.11

EXPLANATION

The number is positive so the leftmost digit must be 0. 0110 is 6 and .01 is 0.25, so 0110.01 = 6.25.

Final Check | Save | Hide Answer *You have used 1 of 2 submissions*

HOMEWORK 4. NUMBERS

Help

Two's complement is an example of *radix complement*, where the complement of an n-digit number is found by subtracting it from r^n, where r is the radix (e.g., 2 for two's complement). Consider *ten's complement*, with n=4.

HOMEWORK 4 A. NUMBERS (1/1 point)

Which of the following is a negative number?

- 1234
- 3456
- 4321
- 6543 ✔

EXPLANATION

All negative values in ten's complement are greater than or equal to 5000.

Final Check | Save | Hide Answer *You have used 1 of 2 submissions*

HOMEWORK 4 B. NUMBERS (1/1 point)

What is the ten's complement of 1849 (i.e., the equivalent of -1849)?

- 849
- 3151
- 8151 ✔
- 9249

EXPLANATION

Complement is found by subtracting 1849 from r^n where r = 10 and n=4 bits. So 10^4 – 1849 = 10000 – 1849 = 8151.

Final Check | Save | Hide Answer *You have used 1 of 2 submissions*

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