Changing a number in base b to base 10:

A. When changing a number to base 10 you need to evaluate the following:

b^n x a + ... + b x a' + a" (a, a', a" represent different digits and b represents the base)

B. Let's look at some examples:

Ex [1] 1241_5 =_____$_{10}$.

a) To change this we need to put the number in this form:

5^3 x 1 + 5^2 x 2 + 5 x 4 + 1

b) This equates to 125 + 50 + 20 + 1 = 196.

c) The answer is 196.

Ex [2] 122_3 = _____$_{10}$.

a) To change this we need to put the number in this form:

3^2 x 1 + 3 x 2 + 2

b) This equates to 9 + 6 + 2 = 17.

c) The answer is 17.

C. Notice that the highest exponent is always 1 less than the number of digits. This might help in figuring out the answer faster.

Ex [1] 1101100_2 =_____$_{10}$

a) Since there are 7 numbers we will start with 2^6.

b) Changing the form we get:

$2^6 + 2^5 + 2^3 + 2^2$ *Notice we can skip the 0's

c) This equates to 64 + 32 + 8 + 4 = 108. (These powers should be memorized from *here*).

d) The answer is 108.