# Converting Signed Hex Directly to Decimal

There are two ways to convert negative two's compliment hexadecimal numbers to decimal.

1) The first is the way the computer does it.

   To convert negative hexadecimal numbers to decimal, start by flipping all of the bits--each 0 becomes a 1, and each 1 becomes a 0. The result is the "complement" of the starting number. For instance, 0xA432 becomes 0x5BCD. The second step is to add one. 0x5BCD becomes 0x5BCE.

   Convert the resulting hexadecimal number to decimal, and put a minus sign in front. 0x5BCE is 23502 decimal, so the value 0xA432 is -23502.

2) The second method is to convert the original number to decimal, then subtract 65536, which is 2 raised to the power 16. Sixteen is the number of bits in a four-digit hexadecimal number. A432 converts to decimal 42034, and 42034 - 65536 is -23502.

   As another example, 0xC (in two's complement) = $(12-2^4)=-4$.

   0xC9=-55=$(12*16+9-2^8)$