For the following questions, *show all of your work.* It is not sufficient to provide the answers.

Exercise 1.   Convert the following numbers.

   a. 62347_{10} to unsigned binary

   b. $8DF6_{16}$ to base 2

   c. 41.375_{10} to base 4

   d. 10011101.0101_2 to base 10

Exercise 2.   Convert each of the following numbers to 8-bit signed magnitude, 8-bit one's complement, 8-bit two's complement and 8-bit excess 128 formats.

   a. $(-122)_{10}$

   b. $(-31)_{10}$

   c. $(-16)_{10}$

   d. 127_{10}

Exercise 3.   Find the decimal equivalents for the following 8-bit two's complement numbers.

   a. 1000 0001

   b. 0111 1011

   c. 1111 0001

   d. 0010 1010

Exercise 4.   Perform two's complement addition on the following pairs of numbers. In each case, indicate whether an overflow has occured.

   a. 1110 1011 + 0110 1001

   b. 1110 1011 + 1111 1111

   c. 1000 1100 + 1100 0001

   d. 0111 1001 + 0000 1001