4. Convert the following numbers to binary:

   a. $(5F.A2)_{16}$

   $$\begin{array}{c|c|c|c|c} (5)_{16} \to 5 & (F)_{16} \to 15 & . & (A)_{16} \to 10 & (2)_{16} \to 2 \\ 0101 & 1111 & . & 1010 & 0010 \end{array}$$

   $\therefore (5F.A2)_{16} = (0101\ 1111\ .\ 1010\ 0010)_2$

   b. $(213.32)_4$

   $$\begin{array}{c|c|c|c|c|c|c} (2)_4 \to 2 & (1)_4 \to 1 & (3)_4 \to 3 & . & (3)_4 \to 3 & (2)_4 \to 2 \\ 10 & 01 & 11 & . & 11 & 10 \end{array}$$

   $\therefore (213.32)_4 = (10\ 01\ 11\ .\ 11\ 10)_2$

5. Obtain the 1's and 2's complements of the following binary numbers by showing the steps:

   a. 10010000

   1s complement: 01101111 (found by simply inverting the bits).
   2s complement: 01110000 (found by adding one to the 1s complement)

   b. 00000000

   1s complement: 11111111 (inverting all bits)
   2s complement: (1)00000000 (adding one to the 1s complement)

   c. 11111111

   1s complement: 00000000 (inverting all bits)
   2s complement: 00000001 (adding one to the 1s complement)