1. (a) (2 points) For the following four numbers given in decimal or hexadecimal notation, write the corresponding binary number using the indicated format.

   $(-48)_{10}$ using 8-bit sign magnitude: _____ $(1011\,0000)_2$ _____

   $(155)_{10}$ using 8-bit unsigned: _____ $(1001\,1011)_2$ _____

   $(-28)_{10}$ using 8-bit two's complement: _____ $(1110\,0100)_2$ _____

   $(BA)_{16}$ using 8-bit unsigned: _____ $(1011\,1010)_2$ _____

   (b) (3 points) State whether the following statements about the binary representation of numbers are *true* or *false*. Give **brief** explanations for the statements that are *false*.

   - Both two's complement and sign/magnitude representation can be used to represent negative numbers in binary.

     Solution: True, however it is more difficult to design arithmetic circuits that work with sign/magnitude format. Still they are used.

   - Using N bits it is possible to represent 2^N different numbers when a sign/magnitude number system is used.

     Solution: False, 0 is represented twice.

   - While there are methods to represent both positive and negative integers, it is not possible to represent fractions or real numbers using binary numbers.

     Solution: False, fixed and floating point number systems can be used to represent such numbers.