COMP.2030 LAB 6

NAME:_____

1. When `x` and `y` are **8 bits** long, and have values `0x00` and `0x7F`, respectively, show result of the following expressions represented in ***hexadecimal***:

   `~x & y` `!x & y` `~x && y`

2. It turns out there is a number that is written in base-7 as "AB" and in base-9 as "BA", for some choice of "A" and "B" between 1 and 6, respectively. What is this number (in decimal) and what are A and B (remember, neither is 0)?

3. The Greek mathematician Archimedes proved that the lower bound of π is 223/71. Encode the 223/71 into the IEEE floating-point format with 4-bit exponent and 8-bit fraction.

   Exponent: Fraction:

4. (15 pt) Consider an IEEE floating point format with 4-bit exponent and 8-bit fraction (no sign bit). Show the values of the following IEEE floating point representations in **binary** scientific notations (1.1×2^{-3}, for example) (the first four bits are exponent bits).

   1110 11110000 –

   1000 00001111 –

   0000 11110000 –