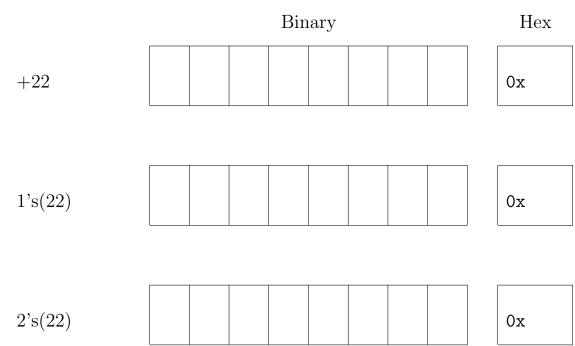
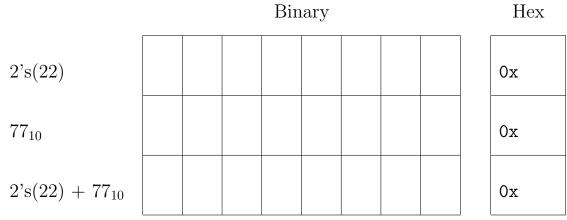
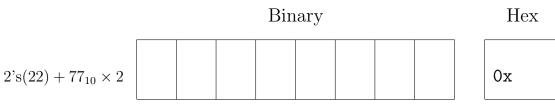
- 2. (50 points) Arithmetic on an 8-bit processor. We have a really \$#!tty 8-bit processor that only has an adder and a bit shifter. It has no ability to perform multiplication or division. We need to compute  $(77_{10} 22_{10}) \times 2$  using only addition and bit shifts.
  - (a) (15 points) First we're going to calculate the 2's complement representation of -22. In the box below, write out the binary representation of +22, then take its two's complement. Also convert the binary to hex in the boxes at right.



(b) (15 points) Now add the two's complement of 22 to 77. The result should be the same as 77-22.



(c) (10 points) Now multiply the result of the addition from part 2(b) by 2 using a bit shift.



(d) (10 points) Convert the result from part 2(c) to **decimal**.