Recitation3 practice

1. Using 4-bit, find the binary representation of 6 in

two's complement 0110
ones' complement 0110
sign-magnitude 0110
as an unsigned 4-bit integer 0110

2. Using 4-bit, find the binary representation of -6 in

two's complement 1010
ones' complement 1001
sign-magnitude 1110

3. Using a 8-bit word, find the binary representation of -6 in

two's complement 1111 1010
ones' complement 1111 1001
sign-magnitude 1000 0110

4. For w=7, what are the largest and smallest signed values? 2^6-1, -2^6
5. For w=7, what are the largest and smallest unsigned values?2^7, 0
6. Assume w = 7, and convert -13 to unsigned.

This means: represent -13 in 7-bit two's complement and then interpret the bit pattern as an unsigned integer. Express the result in decimal.

13: 0001101, -13: 1110011 = 115 in unsigned

7. Assume w = 7, and convert unsigned 53 to signed. 53
8. Assume w = 7, and convert unsigned 103 to signed.

103: 1100111 = -25

9. Assume that a short is represented by 5 bits and an int is represented by 9 bits.What is the output generated by the following code segment:

```
int x = 154;
int y = -154;
short sx = (short)x;
short sy = (short)y;
printf("%d %d %d %d\n",x, y, (int)sx, (int)sy);
printf("%x %x %x %x\n",x, y, (int)sx, (int)sy);
printf("%u %u %u %u\n",x, y, (int)sx, (int)sy);
```

x = 128 + 16 + 8 + 2 = 0 1001 1010 = 0x9a
y = -x = 1 0110 0110 = 358 = 0x166
sx = 1 1010 = -[0 0110] = -6
sy = 0 0110 = 6
(int)sx = -6 = -[0 0000 0110] = 1 1111 1010 = 0x1fa = 506
(int)sy = 6 = 0 0000 0110 = 6
output:
154, -154, -6, 6
0x9a, 0x166, 0x1fa, 0x6
154, 358, 506, 6

10. Using shift and addition/subtraction to express: x*45 = x〈〈5+x〈〈3+x〈〈2+x