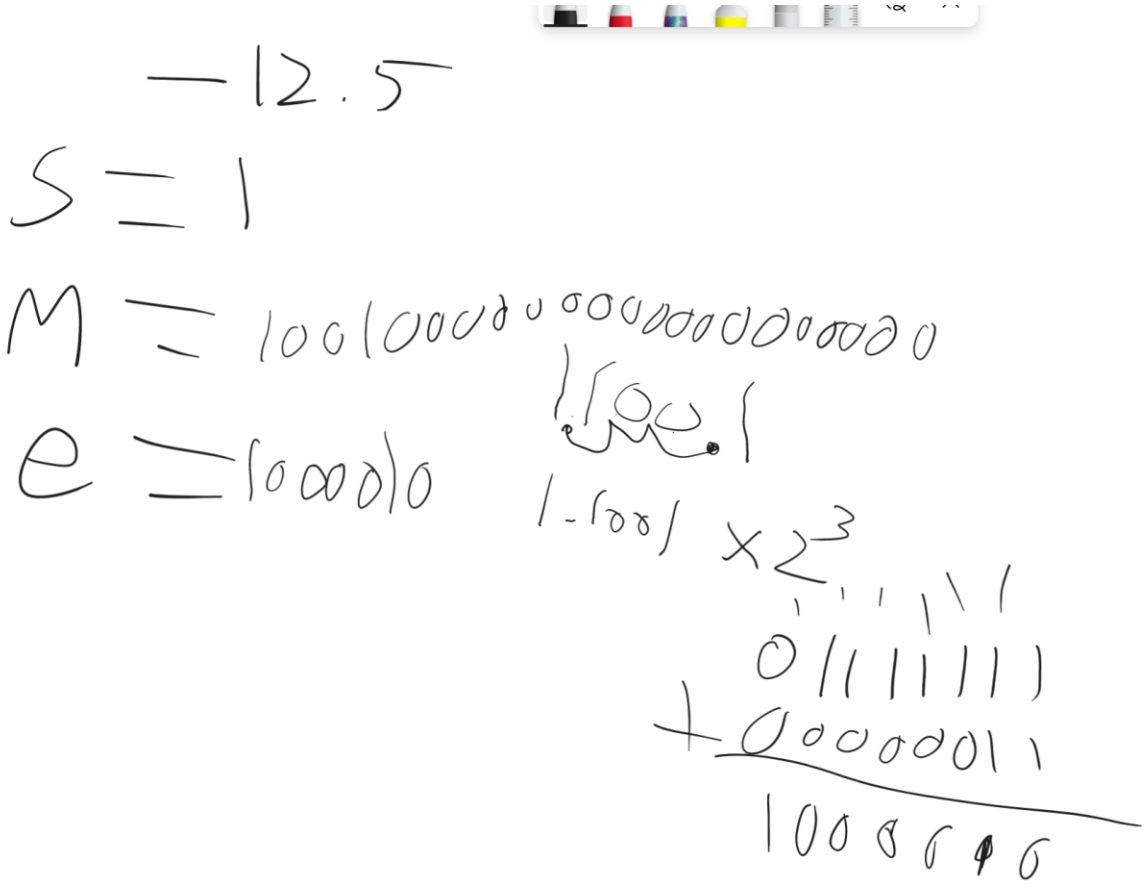
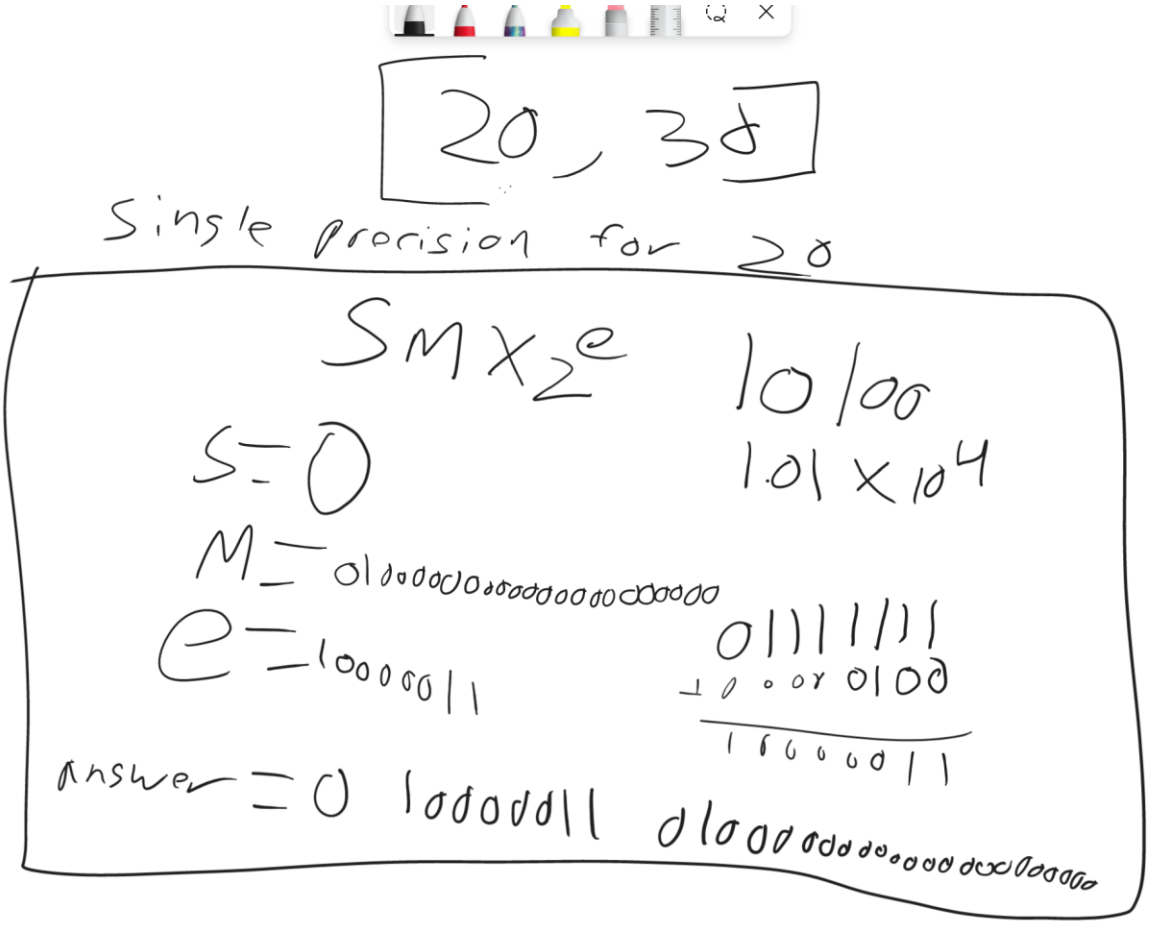
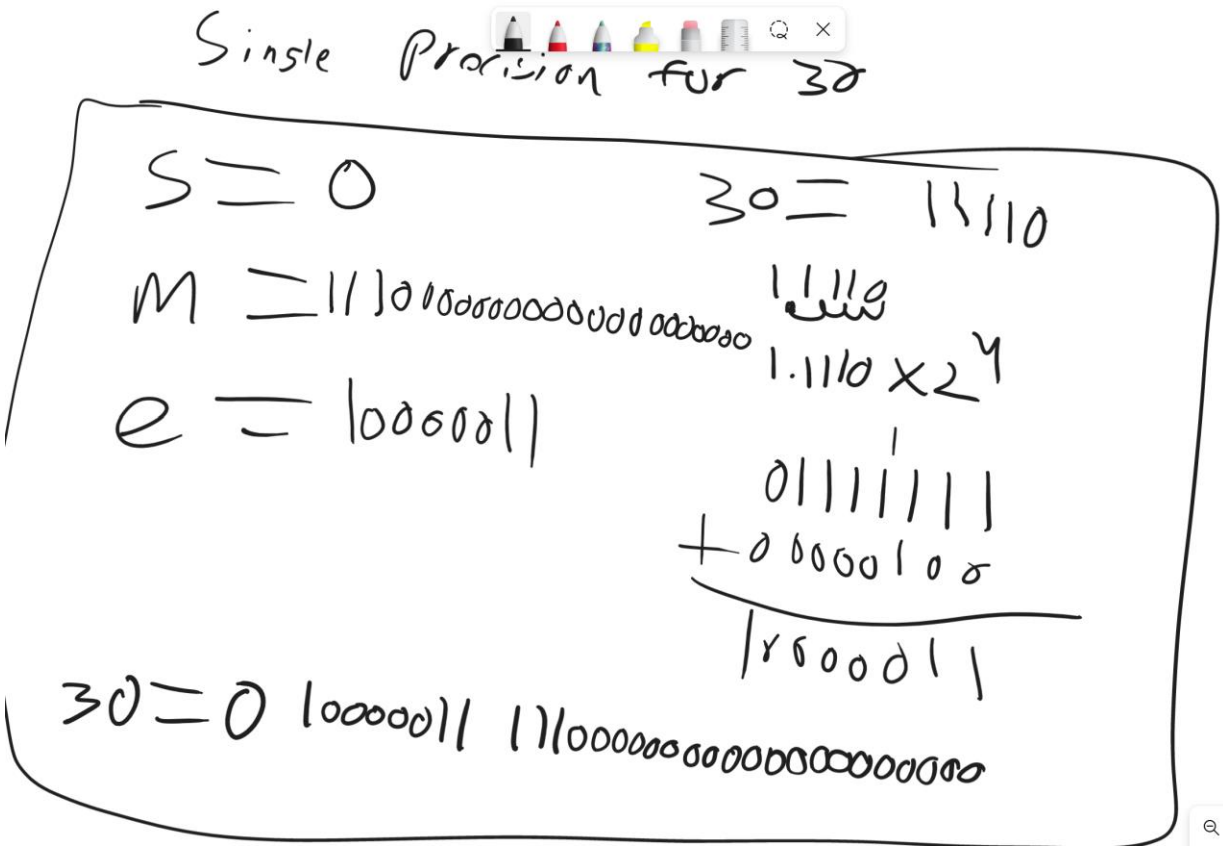
Assignment: Homework Three Name: Cody Strange
Disclaimer: This is my work, not that of others
Total Score: 110 (in points, not percentage)
Problem 1 score: 10
Problem 2 score: 10
Problem 3 score: 10
Problem 4 score: 10
Problem 5 score: 10
Problem 6 score: 10
Problem 7 score: 10
Problem 8 score: 10
Problem 9 score: 10
Problem 10 score: 10
Problem 11 score: 10

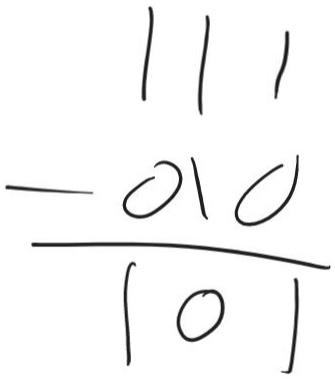
1. Sign bit = negative = 1
   Actual exponent = exponent field + 127 = 3 + 127 = 011 + 01111111 = 10000010
   Mantissa = 10010000000000000000
   Answer = **1 100000010 10010000000000000000000**



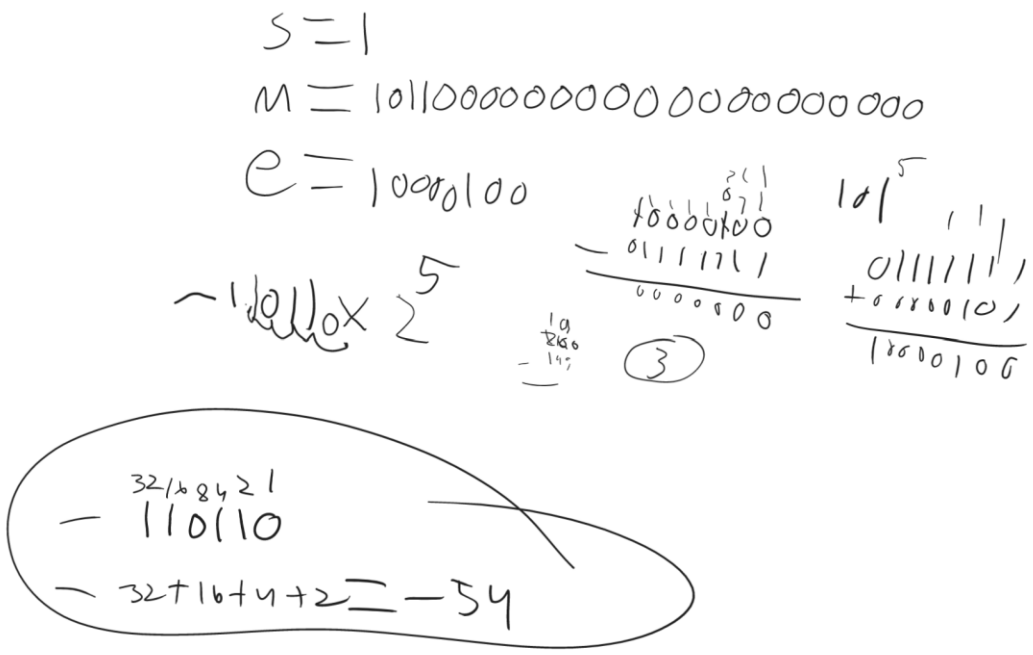
2.


20, 38
Single precision for 20
SMx2^e
10100
1.01 x 10^4
S=0
M=01000000000000000000000
e=10000011
01111111
+ 00000100
10000011
Answer=0 10000011 01000000000000000000000





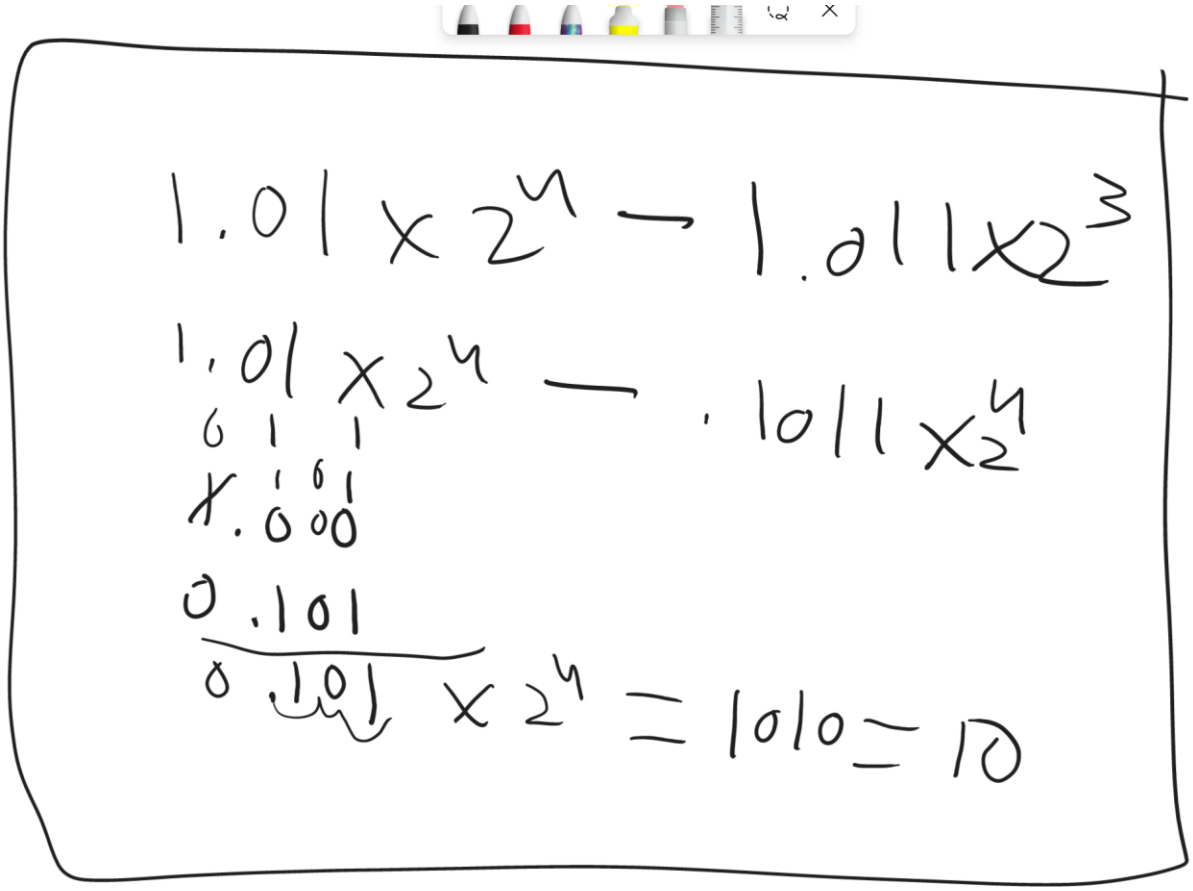
30 = 0 10000011 11100000000000000000000
20 = 0 10000011 01000000000000000000000
111 – 010 = 101
$101 * 2^{20} = 5*2^{20}$ = **5242880**


S = 1
M = 10110000000000000000000
e = 10000100
32 16 8 4 2 1
110110
32+16+4+2 = -54

3.

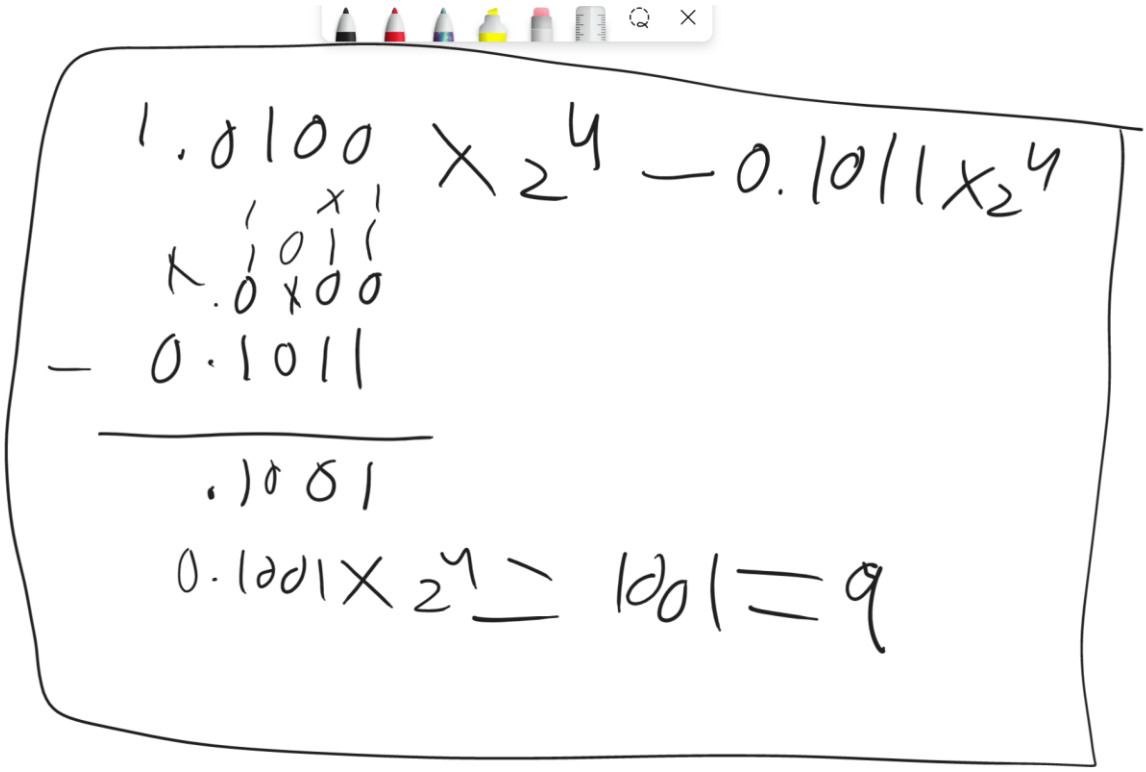
-54

4. A)


1.01 x 2^4 → 1.011x2^3
1.01 x 2^4 → .1011 x 2^4
0 1 1
x.001
0.101
0.101 x 2^4 = 1010 = 10

10

B)



9

5. The number of differing numbers between the two numbers
6. Sign bit can be a 1 or a 0, Exponent is all 1s, Mantissa are all 0s
7. Sign bit can be a 1 or a 0, Exponents is all 1s, Mantissa can be anything that isn't a 0
8. Sign bit can be a 1 or a 0, Exponents is all 0s, Mantissa are all 0s
9. Sign bit can be a 1 or a 0, Exponents is all 0s, Mantissa can be anything
10. (a) The spacing between subnormal numbers is determined by the position of the leading bit
    (b) The closer you get to 0 the larger your roundoff error gets
11. Extra bits saved for the floating-point operations, they reduce roundoff error