Meg McCauley

HW 3

① $91_{10} + C6_{16}$
(12) (6)

0 1 0 1 1 0 1 1₂ + 1 1 0 0 0 1 1 0
128 64 32 16 8 4 2 1

1 1 1 1 1
0 1 0 1 1 0 1 1
+ 1 1 0 0 0 1 1 0
1 0 0 1 0 0 0 0 1₂
256 32 1

$= \cancel{331_0}$ $= \boxed{289_{10}}$ unsigned floating point

② $118 - 11_{10}$

0 1 1 1 0 1 1 0₂
+ 1 1 1 1 0 1 0 1
1 0 0 0 0 0 1 1 0₂
4 2

Signed (+) floating point $= \boxed{6_{10}}$

0 0 0 0 1 0 1 1₂ = 11_{10}
1 1 1 1 0 1 0 0
+ 1
1 1 1 1 0 1 0 1₂ = -11_{10}

③ $12.3125_{10} + 0110$ IEEE Q2

1 1 0 0 . 0 1 0 1₂
+ 0 0 0 1 . 1 0 0 0₂
1 1 0 1 . 1 1 0 1₂ $= \boxed{13.8125_{10}}$ unsigned fixed point

④ $5.75_{10} - 7.125_{10}$

0 1 0 1 . 1 1 0 0
8 4 2 1 .5 .25 .125 .0625

0101.1100
+ 1000.1110
1110.1010₂ $= -2_{10} + .625_{10} = \boxed{-1.375_{10}}$ signed fixed point

0 1 1 1 . 0 0 1 0 $= -7.125_{10}$
1 0 0 0 1 1 1 1
+ 1
1 0 0 0 . 1 1 1 0 $= -7.125$

(5) $9_{10} \cdot 3_{10}$

~~0000 1001 · 0011 ... 0 0 0 0 1 0 1 1~~

```
   1001
 · 0011
 ------
   1001
  10010
 000000
0000000
-------
00110111₂
```

$= 27_{10}$

unsigned floating point

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(6) $(-5)_{10} \cdot (-6)_{16}$

```
0 1 0 1 = 5₂        0110 = 6₂
1 0 1 0             1001
+     1             +  1
-------             ----
1 0 1 1 = -5₂       1010 = -6₂
```

```
       1011
     · 1010
     ------
       0000
  1 1 10110
   000000 0
   1011000
 1 0 1 1 0000
1 0 0 1 1 00000
---------------
0 0 0 0 1111 1 0₂
```

$= 30_{10}$

Signed(+) floating point

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(7) $9.5_{10} \cdot 2.625_{10}$

1 0 0 1 . 1 0 0 0

0 0 1 0 . 1 0 1 0

```
      1001.1
    × 10.101
    --------
       10011
      00000
     10011
    00000
   10011
-----------
11000.11111₂
```

$= 24.9375_{10}$

unsigned fixed point

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(8) $(-1.25)_{10} \cdot 3.5_{10}$

0+.75₁₀ → 0.11

~~1.01 ... 0.1~~

11.1

```
        1110.11  I4Q2
        0011.1   I4Q1
        --------
        1110 11
      1 1110110
  + 1 11101100
  ------------
negative [1] 1 011.101₂   I4 Q3
```

$-5_{10} - .625_{10}$

$= -4.375_{10}$

signed fixed point