



ICT AND COMPUTING

Floating Point Representation (Student)

→ Positive Mantissa & Positive Exponent

Mantissa	Exponent	Answer
0.1110000	0011	+7
0.1101101	0100	
0.1001100	0111	
0.1111010	0010	
0.1010101	0101	
0.1100110	0010	

→ Positive Mantissa & Negative Exponent

Mantissa	Exponent	Answer
0.1010000	1111	+0.3125
0.1110000	1111	
0.1010000	1110	
0.1100000	1101	
0.1111000	1111	
0.1010100	1110	

→ Negative Mantissa & Positive Exponent

Mantissa	Exponent	Answer
1.0111010	0100	-8.75
1.0100011	0101	
1.0110000	0010	
1.0101011	0100	
1.0001100	0011	
1.0000001	0110	

→ Negative Mantissa & Negative Exponent

Mantissa	Exponent	Answer
1.0110000	1111	-0.3125
1.0111000	1101	
1.0101000	1110	
1.0110000	1101	
1.0100000	1111	
1.0010000	1110	

→ Twos Complement Rule

- Flip the bits
- Add 1

→ Binary Point Rules

- Positive: Left
- Negative: Right

→ Binary Addition Rules

- $0 + 0 = 0$
- $0 + 1 = 1$
- $1 + 0 = 1$
- $1 + 1 = 0$ carry 1
- $1 + 1 + 1 = 1$ carry 1

→ Binary Fraction Lookup Table

Binary Fraction	Fraction	Decimal Fraction	Binary Fraction	Fraction	Decimal Fraction
0.1	1/2	0.5	0.000001	1/64	0.015625
0.01	1/4	0.25	0.0000001	1/128	0.0078125
0.001	1/8	0.125	0.00000001	1/256	0.00390625
0.0001	1/16	0.0625	0.000000001	1/512	0.001953125
0.00001	1/32	0.03125	0.0000000001	1/1024	0.0009765625