

MIPS Floating Point Quiz

1.

$$5.75 = \boxed{101.11_2}$$

$$2^2 + 2^0 + 2^{-1} + 2^{-2}$$

$$4 + 1 + \frac{1}{2} + \frac{1}{4}$$

$$5.75$$

$$63/64 =$$

$$64/64 = 1.0000000$$

$$2^{-6} = \frac{1}{64}$$

$$-1/64 = 0.000001$$

$$= \boxed{0.111111_2}$$

$$9.8125 = 1001 + \dots$$

$$0.8125 \times 2 = 1.625$$

$$0.625 \times 2 = 1.25$$

$$0.25 \times 2 = 0.5$$

$$0.5 \times 2 = 1$$

1	= 0.5
1	0.25
0	0.125
1	.0625

$$\boxed{1001.1101_2}$$

2. $34.890625 = 100010 + \dots$

$$0.890625 \times 2 = 1.78125$$

$$0.78125 \times 2 = 1.5625$$

$$0.5625 \times 2 = 1.125$$

$$0.125 \times 2 = 0.25$$

$$0.25 \times 2 = 0.5$$

$$0.5 \times 2 = 1$$

1
1
1
0
0
1

$$100010.111001 = 1.00010111001 \times 2^5$$

0
sign

$$5 + 127 = 132 = 10000100$$

0 10000100 000101110010000...
sign exp mantissa \rightarrow 0's continue

3. 0 01111011

0 \rightarrow 0

exp = 123

mantissa

$$123 - 127 = -4$$

$$1.0 \times 2^{-4} \text{ base } 2$$

$$0.0001 \text{ base } 10$$

$$\boxed{0.0001_{10}}$$

4. A denormalized number is a number where the exponent is biased.

smallest 0 00001 0000000000
sign exp mantissa

largest 0 11110 1111111111
sign exp mantissa