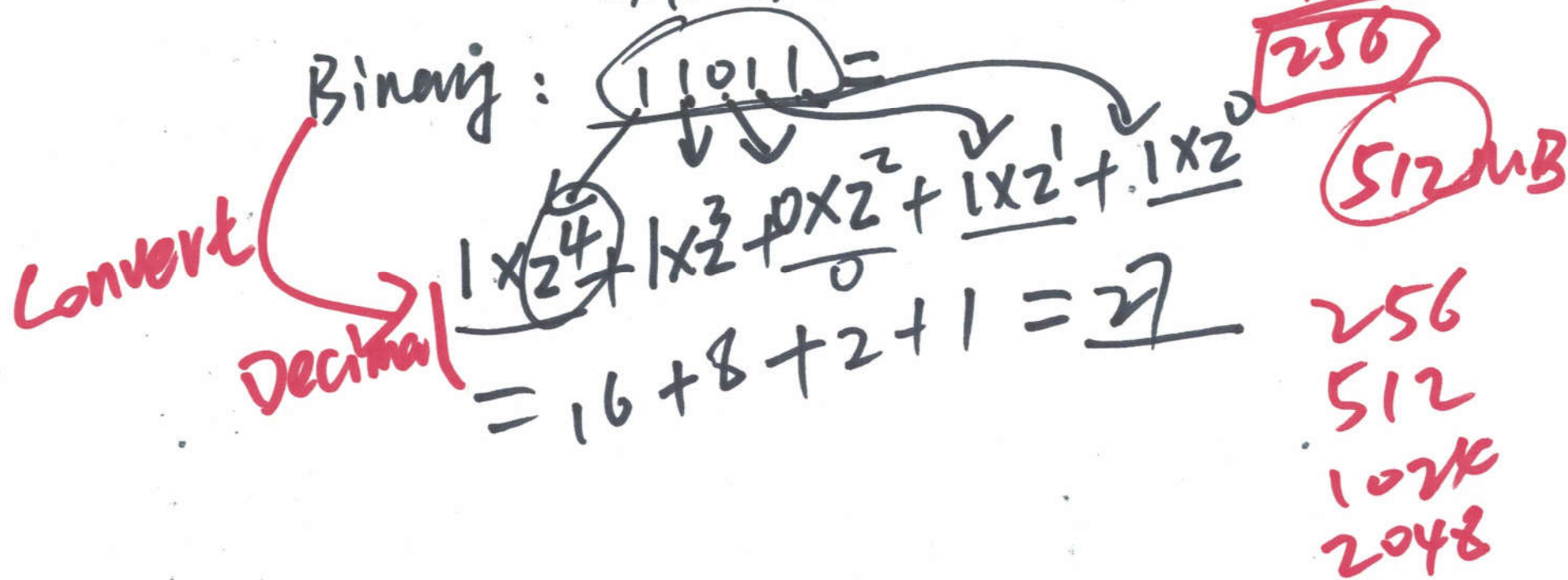
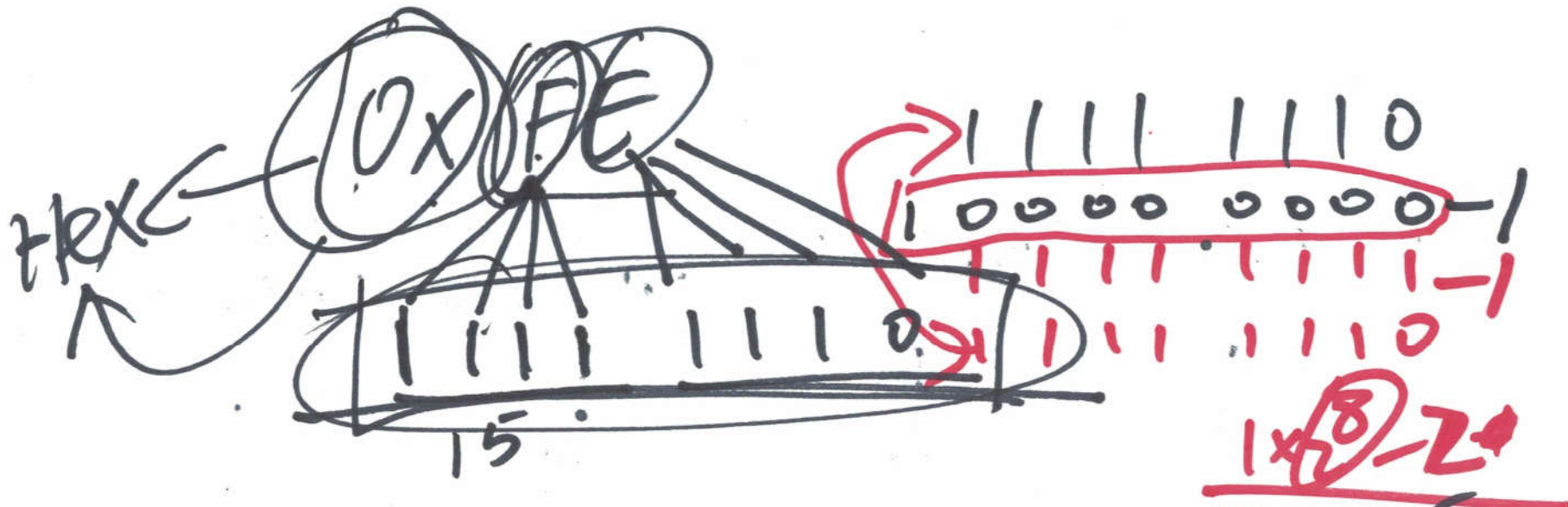


Number Systems

Decimal (10-based)	Binary (2-based)	Octal (8-based)	Hex (16-based)
0	0	0	0
1	1	1	1
2	10	2	2
3	11	3	3
4	100	4	4
5	101	5	5
6	110	6	6
7	111	7	7
8	1000	10	8
9	1001	11	9
10	1010	12	A
11	1011	13	B
12	1100	14	C
13	1101	15	D
14	1110	16	E
15	1111	17	F
16	10000	20	10

$16 + 15 = 31$
 $(16) = 31$

①



(2)

$35 \rightarrow (100011)_2$

2	35	1 1 0 0 0 0 1	1+
2	17		2+
2	8		
2	4		
2	2		
2	1		32+
	0		

35

$2 \cdot 3 \cdot 5 \cdot 9 \cdot 6 \rightarrow$

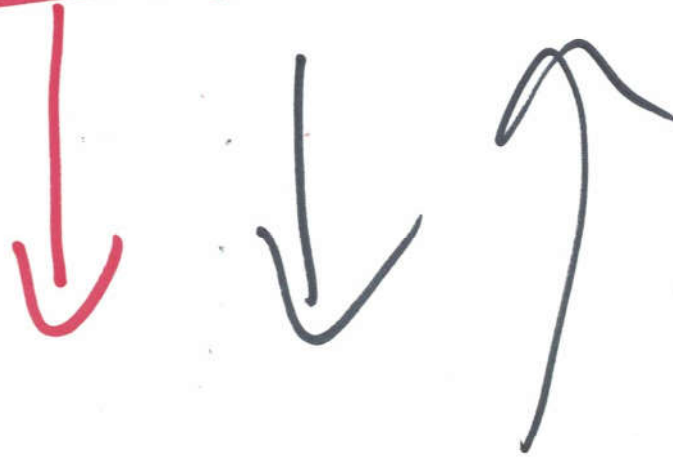
6	↑
9	
5	
3	
2	

100011

3

Binary \rightarrow Hex

000(110111011111)₂



(1 D D F)₁₆

0x 1 D D F
000 1101 1101 1111

(4)

ground → 5V/3V/voltage High

logic

AND	0	1	A	\bar{A}
0	0	0	0	0
1	0	1	A	\bar{A}
A	0	A	A	0
\bar{A}	0	\bar{A}	0	\bar{A}

5

logic

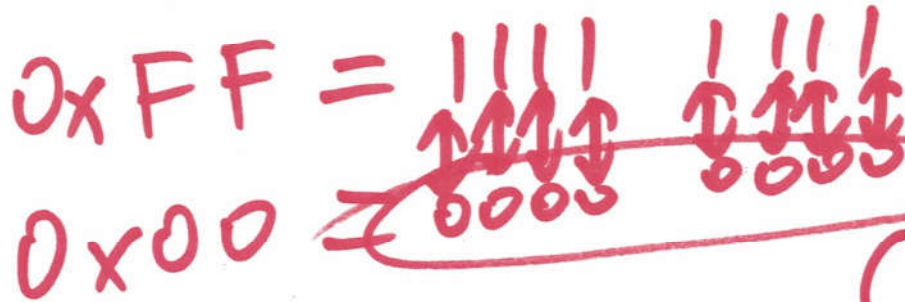
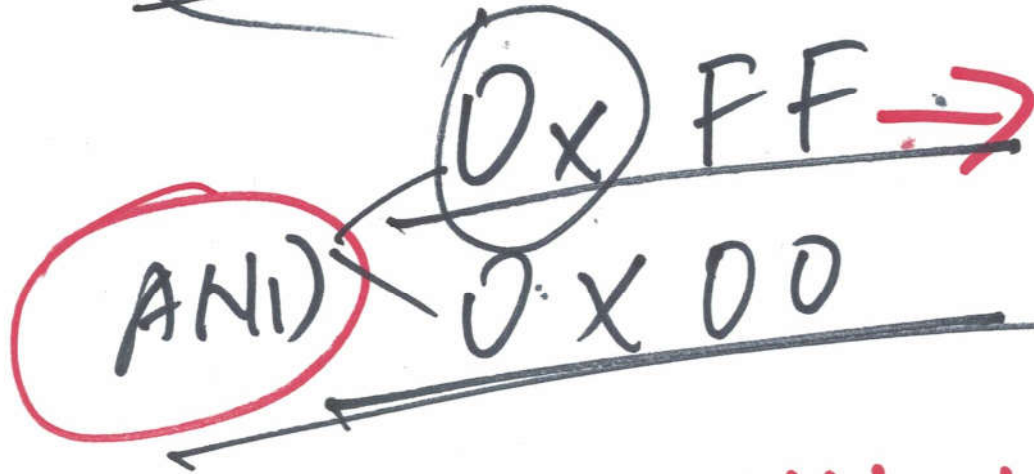
OR	0	1	A	\bar{A}
Q	0	1	A	\bar{A}
1	1	1	1	1
A	A	1	A	1
\bar{A}	A	1	1	\bar{A}

(A) \bar{A}

(b)

Bit-wise AND

8 7 6 5 4 3 2 1 0



Var = 0x 00

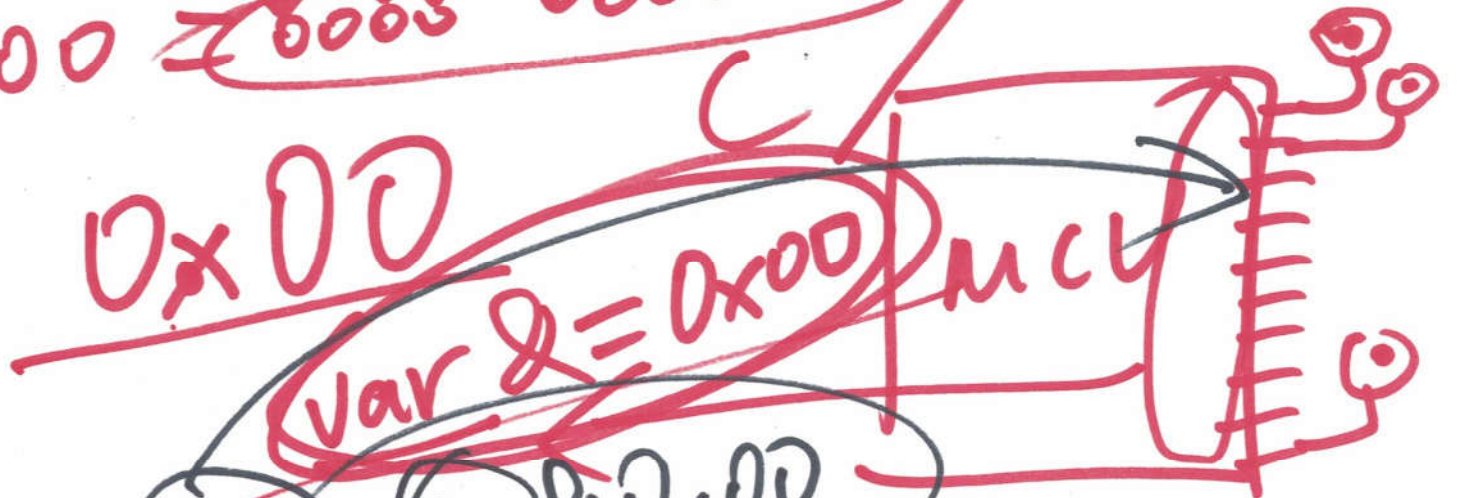
OX 00

Var & 0x 00

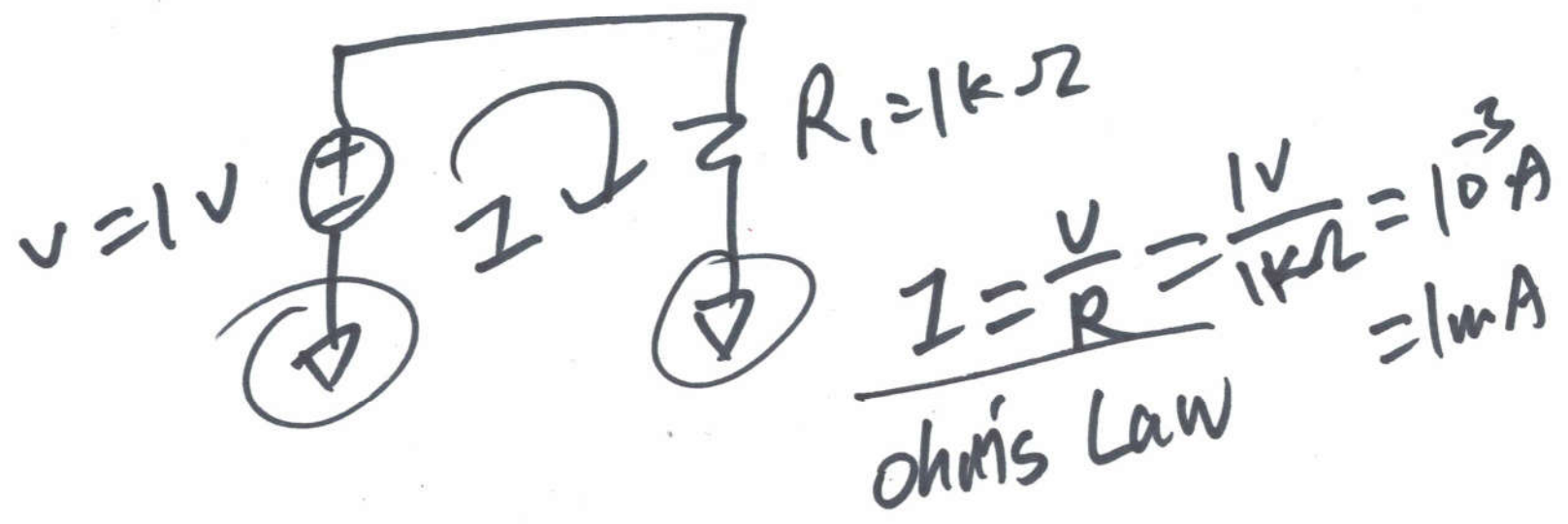
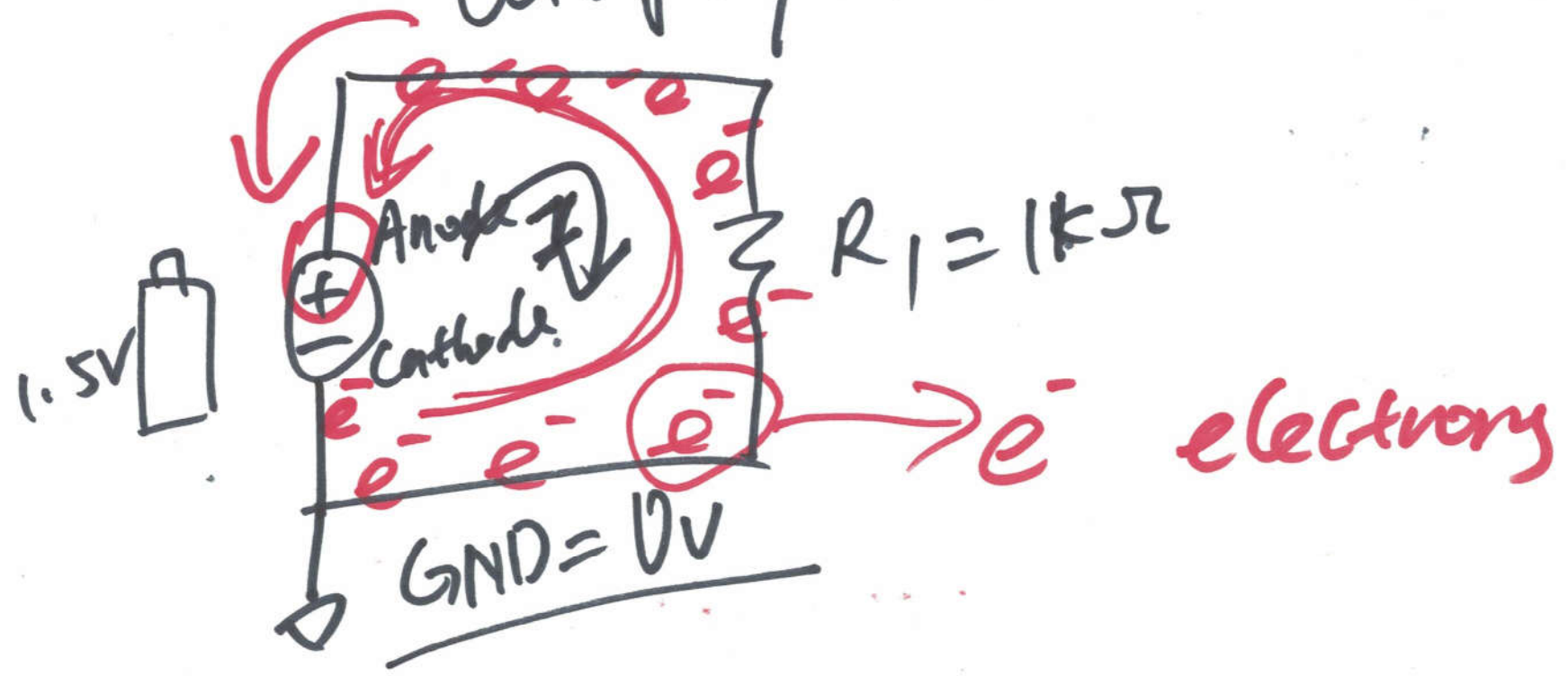
Var = Var & 0x 00

OX FE
OX 12
OX DE

Q



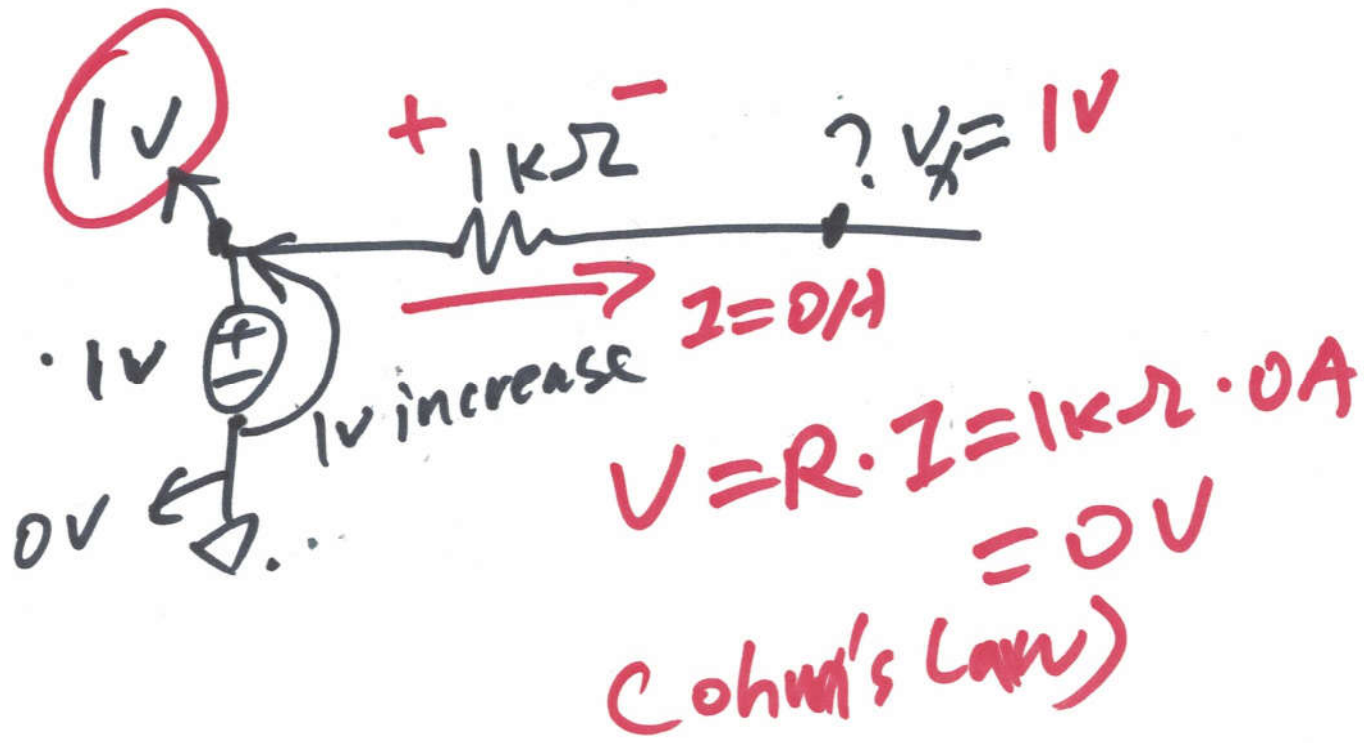
· Voltages / currents



$$I = \frac{V}{R} = \frac{1V}{1k\Omega} = 10^{-3} A = 1mA$$

ohm's Law

(8)



9

Decimal \rightarrow Hex

16 | 215

~~2~~