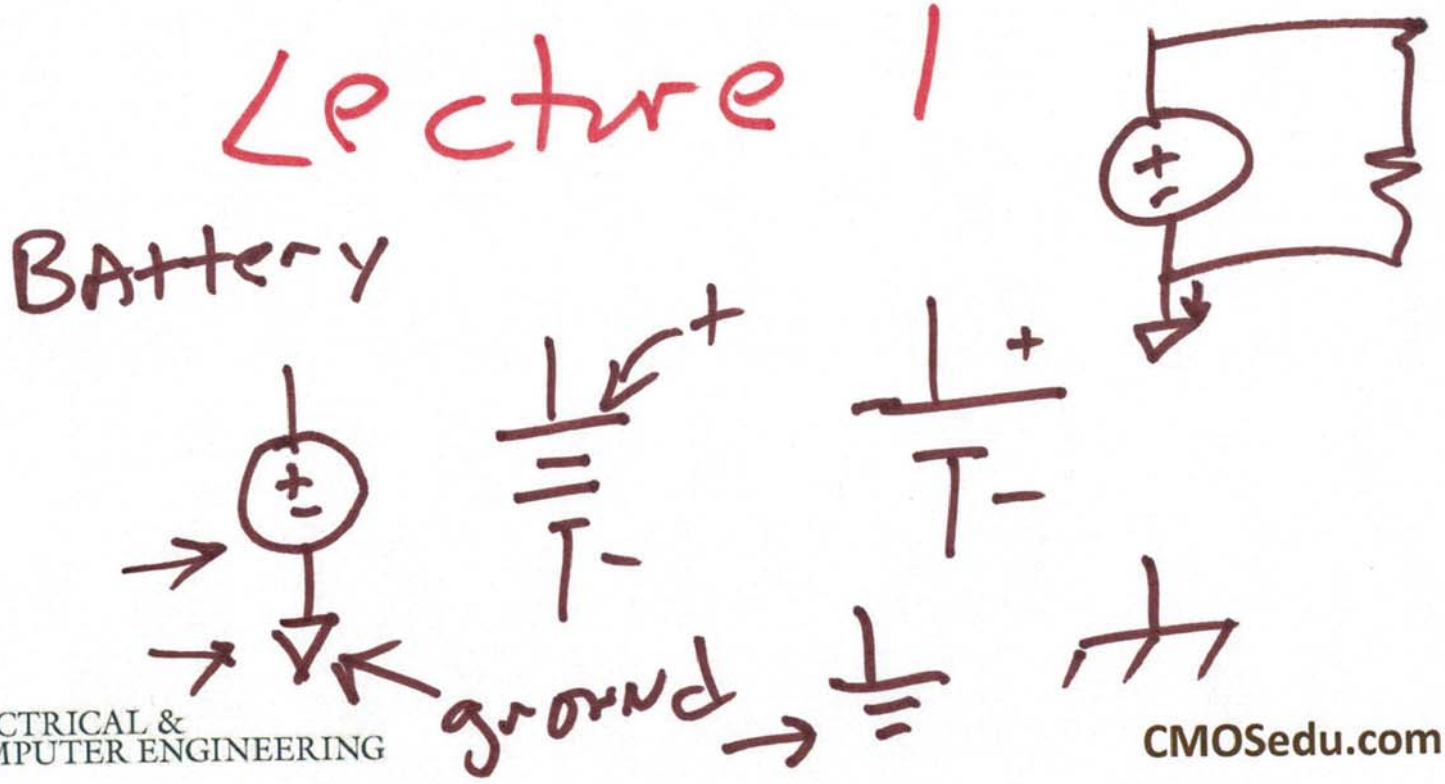
EE 220
Circuits I

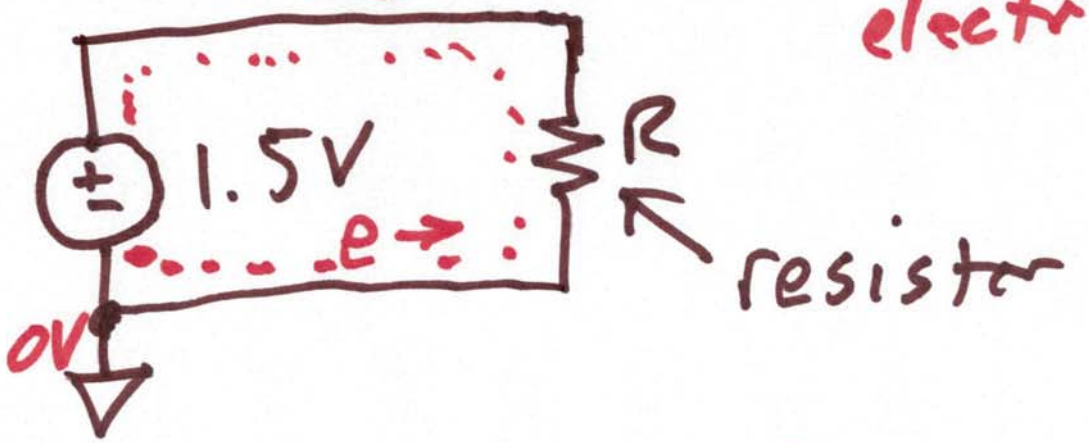
August 28, 2017

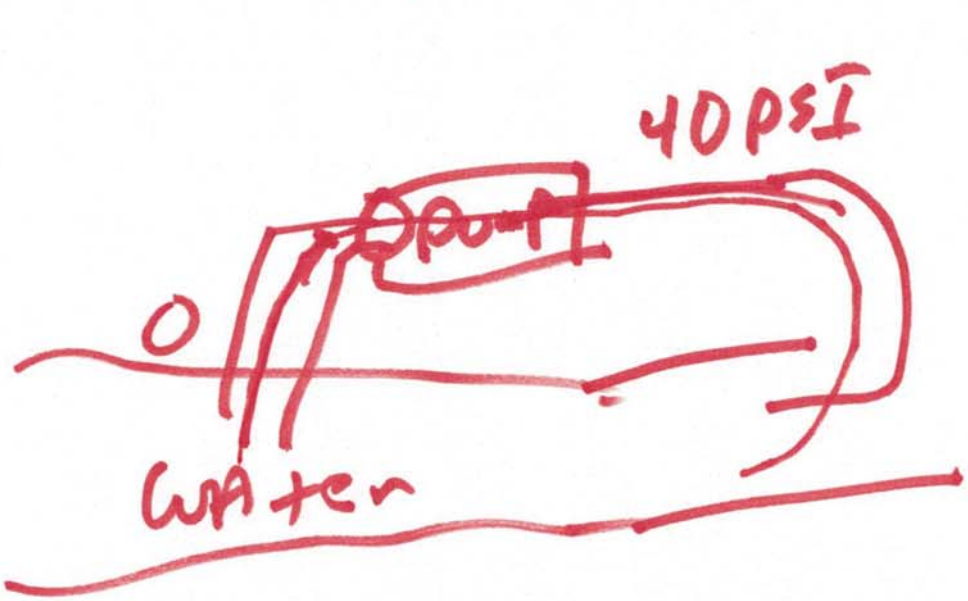
Lecture 1

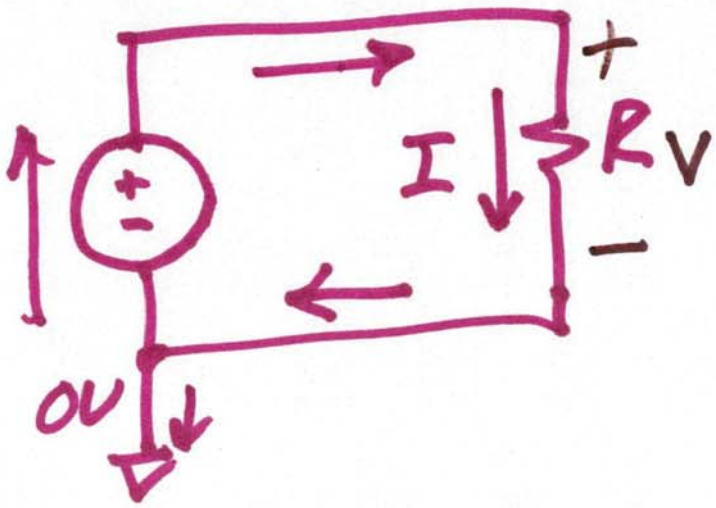


Battery

I=current is opposite electron flow





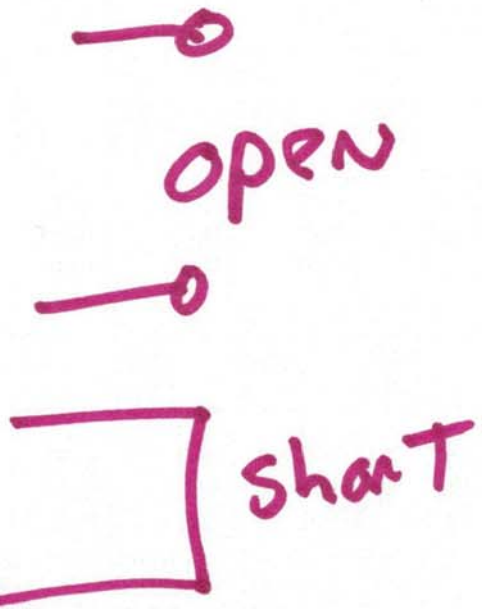


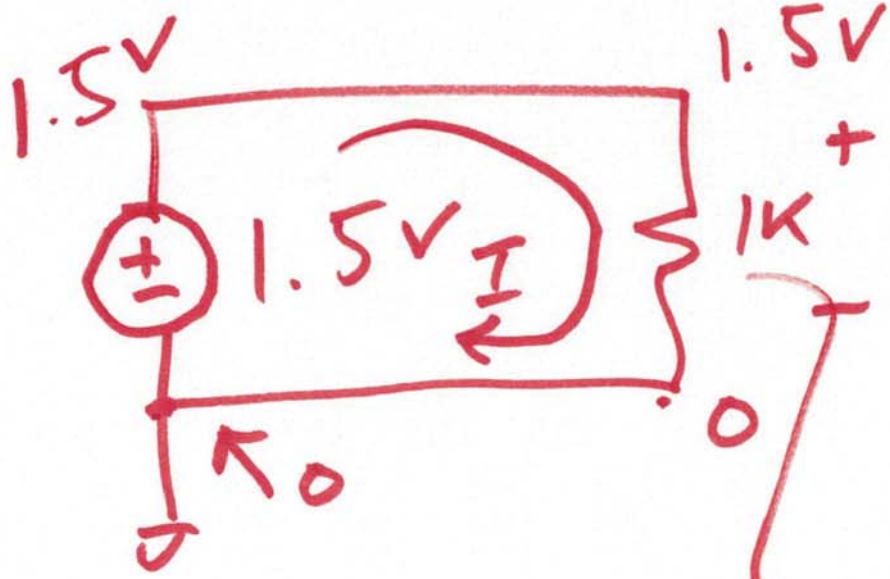
$R \to \infty$ (open)

$R \to 0$ (short)

Ohm's law

$$V = I \cdot R$$





$V = IR$

$I = ?$

$I = \frac{V}{R} = \frac{1.5}{1K} =$

1.5 mA

$1.5e{-}3$

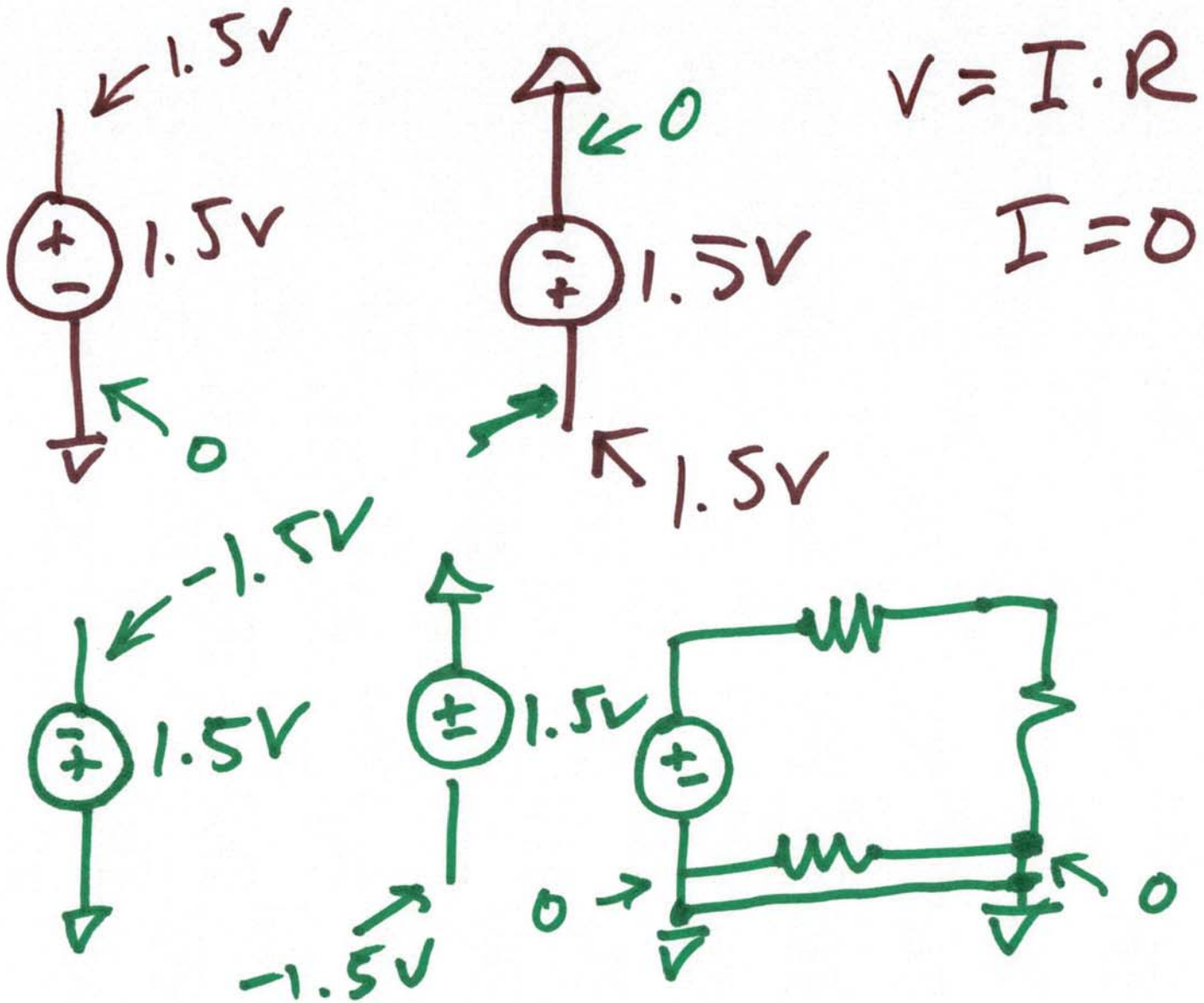
$1{,}000\ \Omega$

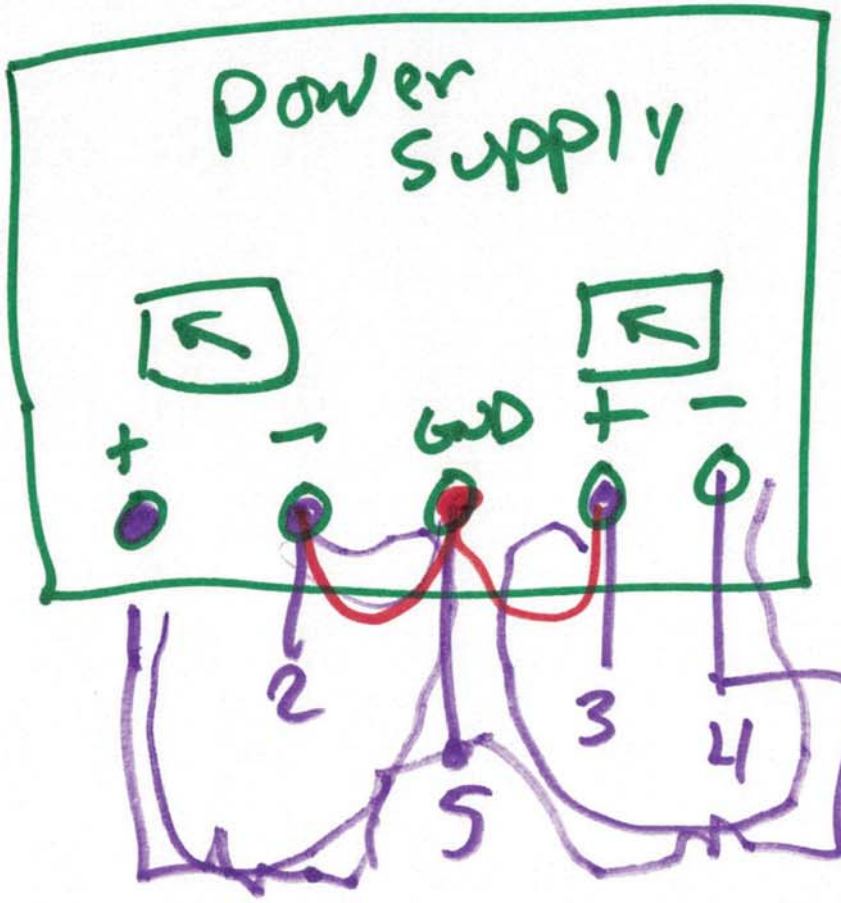
Ω ← unit of resistance

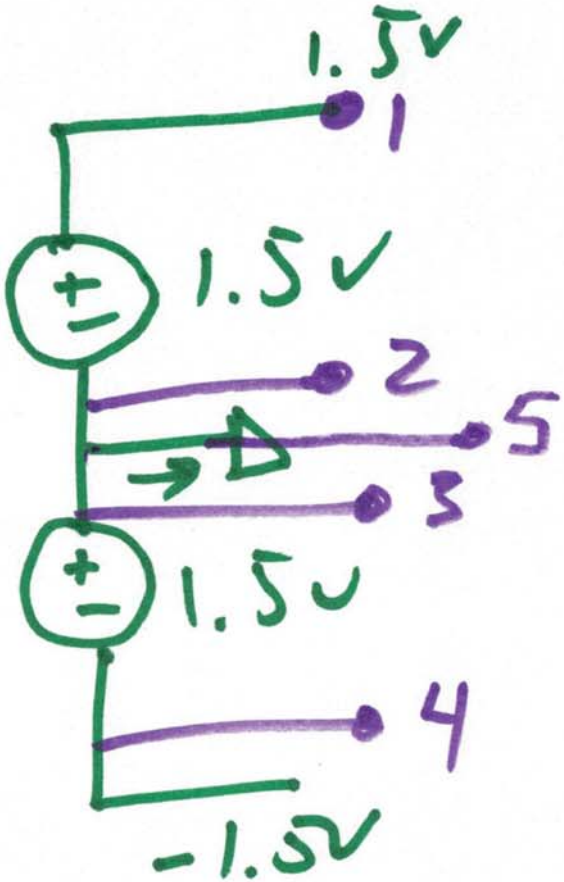
ohms

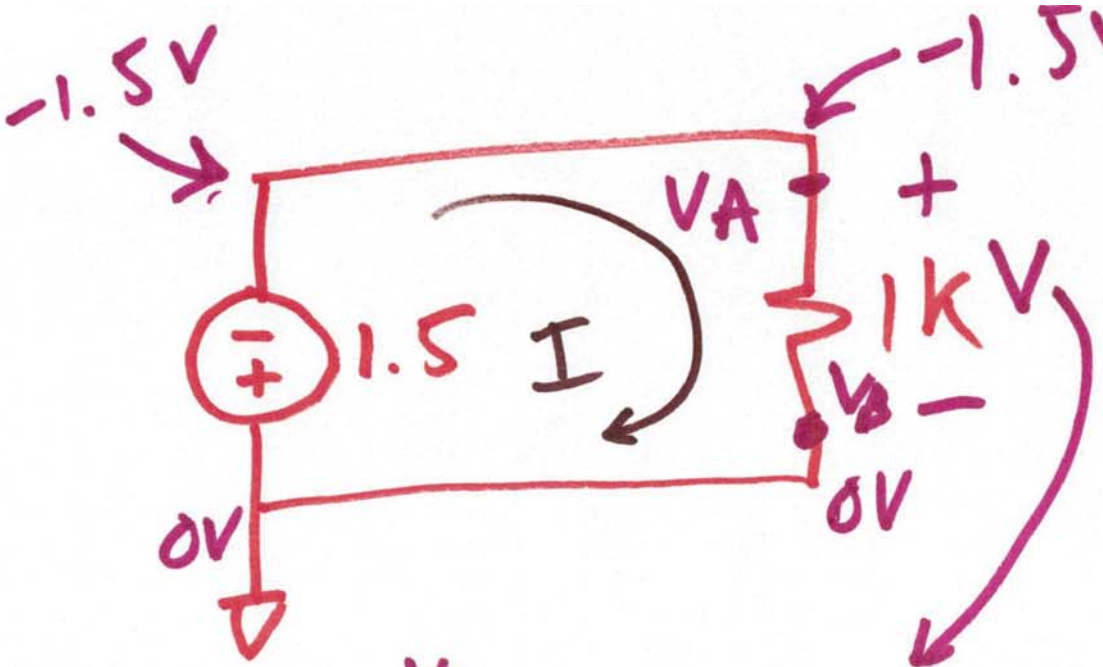
current → Amperes

" $\frac{\text{Coloumbs}}{s}$


1.5V
1.5V
0
0
1.5V
1.5V
V = I · R
I = 0
-1.5V
1.5V
1.5V
-1.5V
0
0


Power
supply
+
−
GND
+
−
2
3
4
5


1.5V
1
1.5V
2
5
3
1.5V
4
-1.5V



$I = ?$

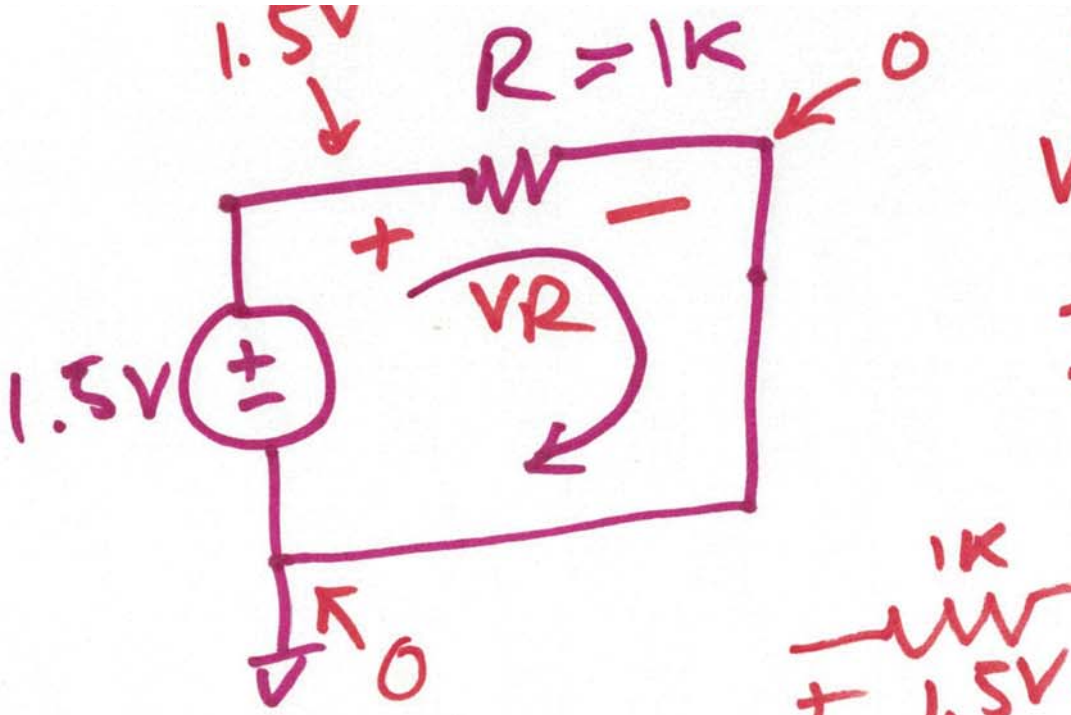
$V = I \cdot R$

$R = \frac{V}{I}$

V_A + $V = V_A - V_B$ − V_B

$-1.5 - 0 = -1.5V$

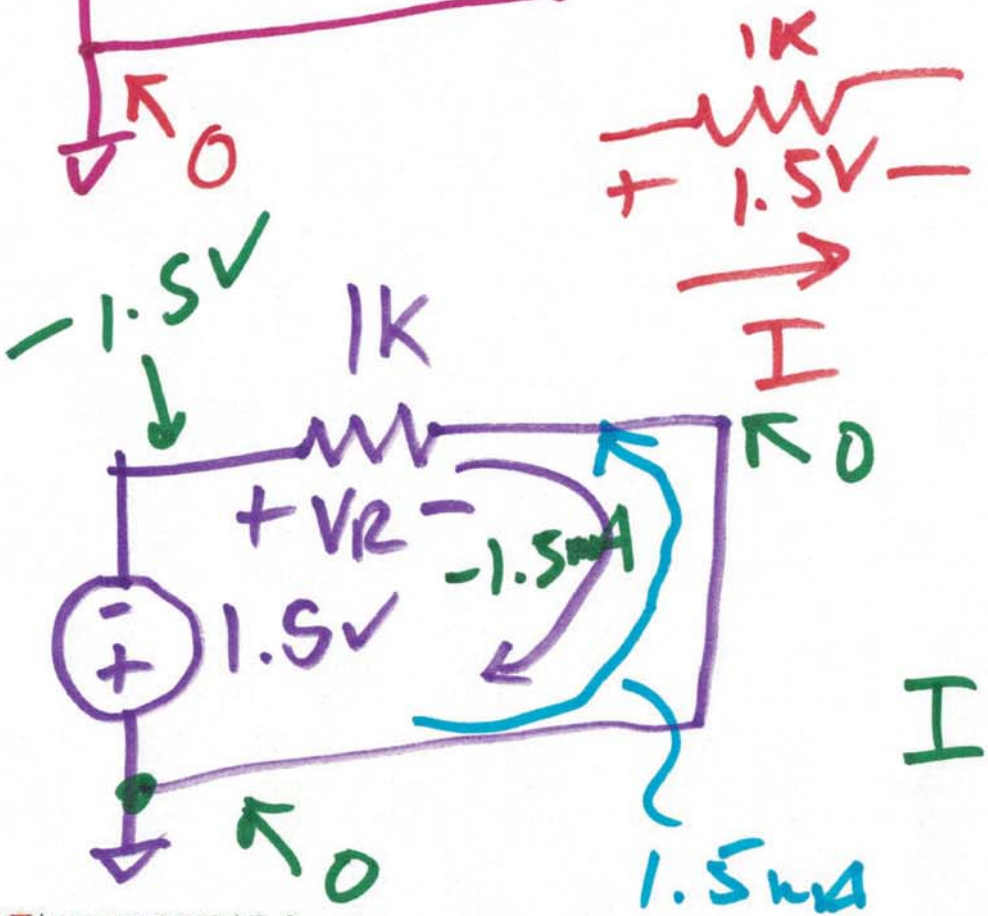
$I = \frac{-1.5V}{1K} = -1.5mA$



$V = IR$

$V_R = 1.5 - 0 = 1.5V$

$I = \frac{1.5V}{1K} = 1.5mA$

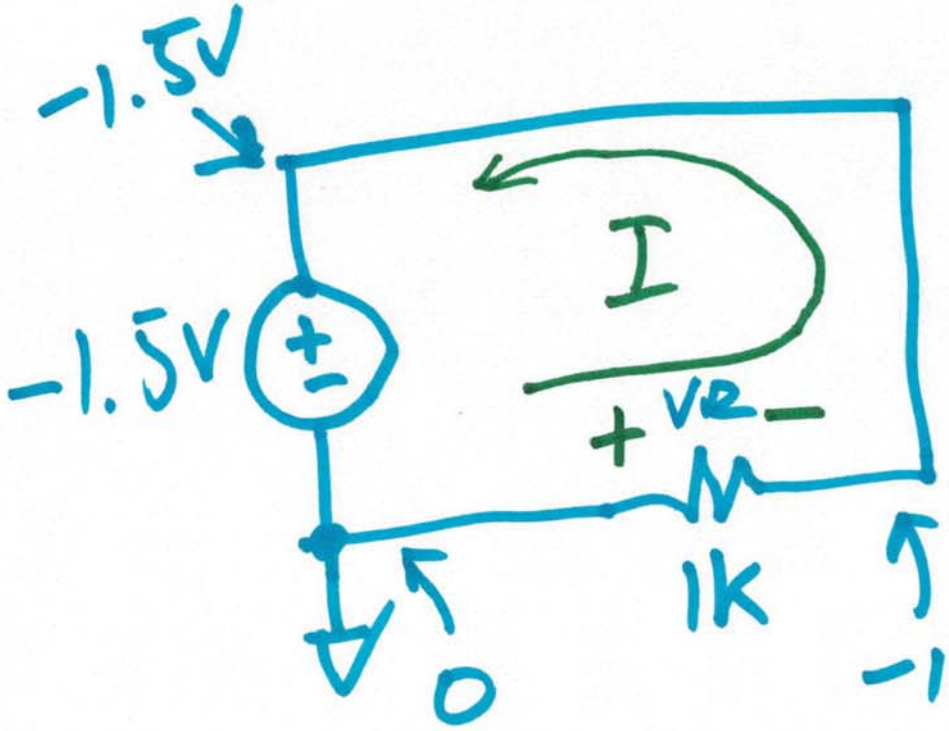


$V_R = -1.5 - 0$

$= -1.5V$

$I = \frac{-1.5V}{1K}$

$= -1.5mA$

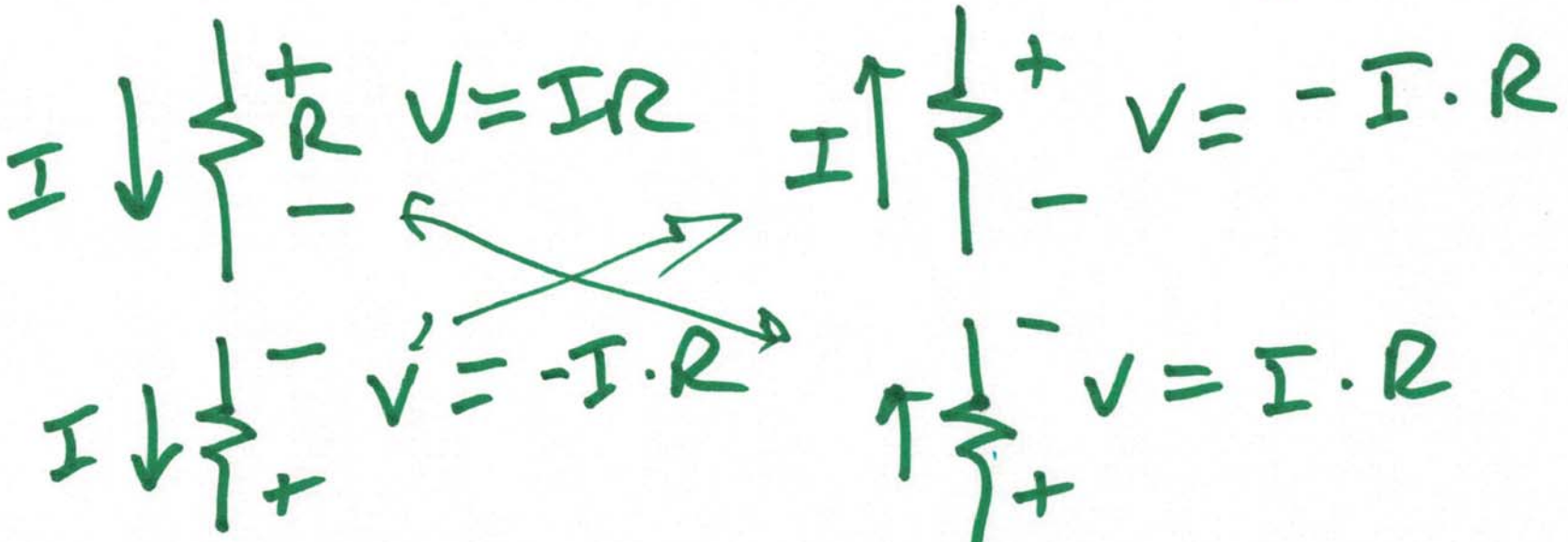


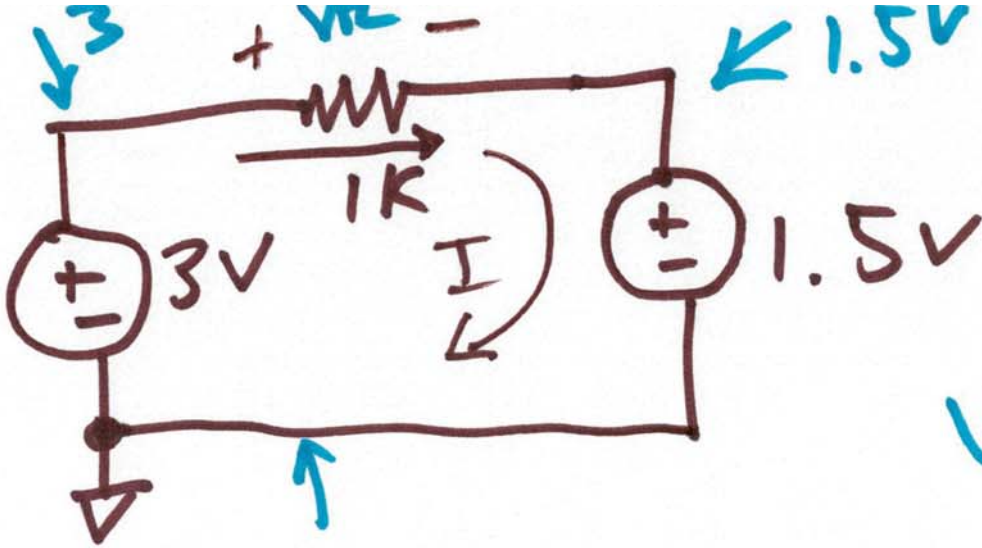
$V_R = 0 - (-1.5V)$

$V_R = 1.5V$

$I = 1.5mA$

$\frac{1.5}{1K\Omega} = \uparrow$



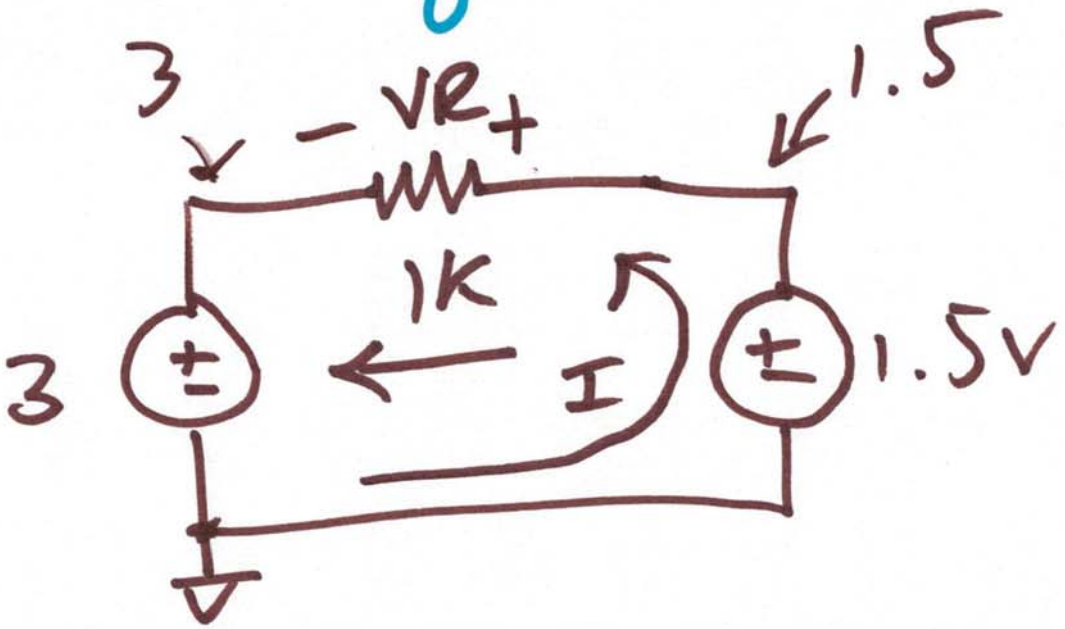


$V = I \cdot R$

$V_R = 3 - 1.5$

$= 1.5V$

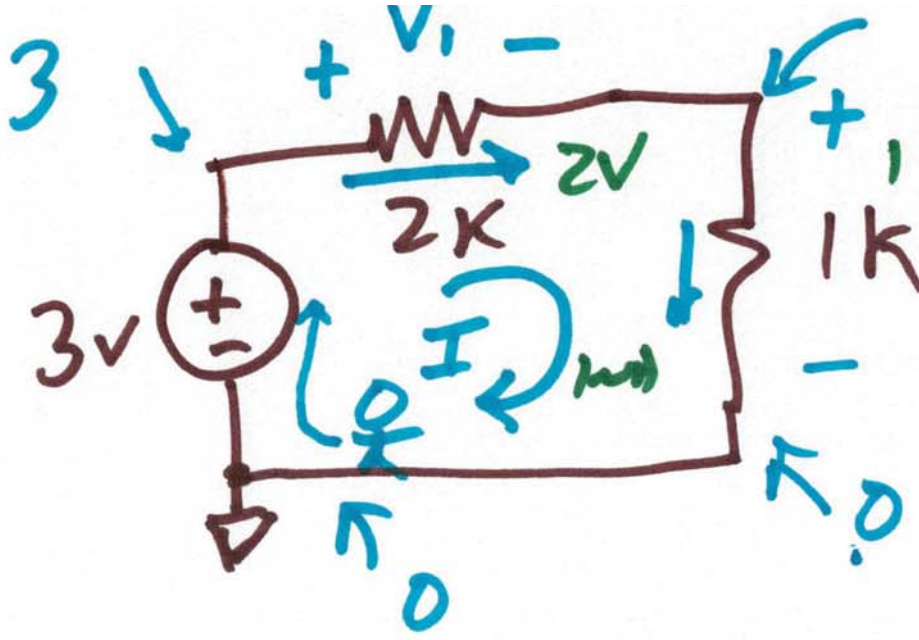
$I = \frac{1.5}{1K} = 1.5mA$



$V_R = 1.5 - 3$

$= -1.5V$

$I = \frac{-1.5}{1K} = -1.5mA$



$V_2 = V_2 - 0$

$V_1 = 3 - V_2$

$V_1 = I \cdot 2K$

$V_2 = I \cdot 1K$

$I \cdot 2K = 3 - I \cdot 1K$

$I = \frac{3}{3K} = 1\,mA$