2012/3/12

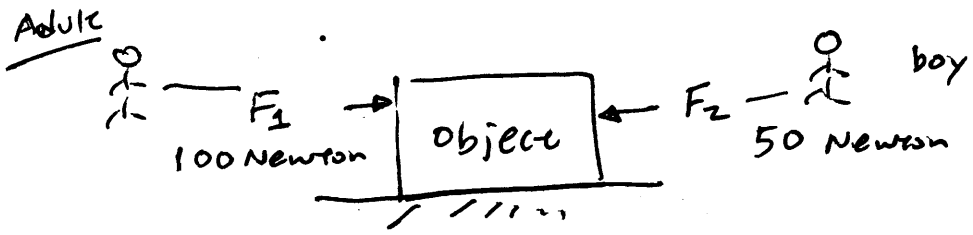
1. Review of EXAM 2 Coverage — March 14

2. LAB 8 (Theory)

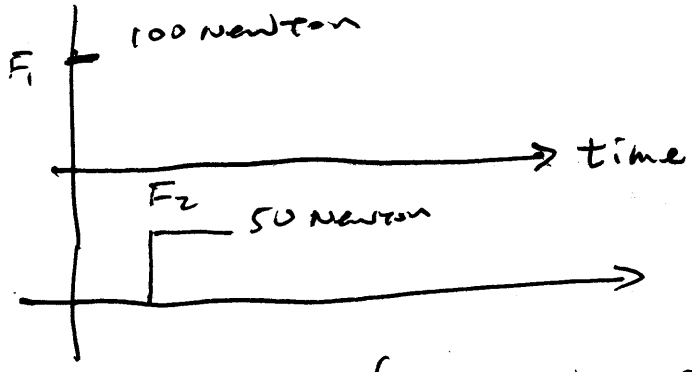
Ch 8-1, 8-2 current source

current ⟷ voltage source conv.

ch 9-2. Superposition Theorem



$$\sum F = F_1 + F_2 = 0$$



$$F_1 - F_2 = (100 - 50) = 50 \text{ Newtons}$$

Vector : magnitude 50 newton

Direction (Left to Right)

Multiple Sources

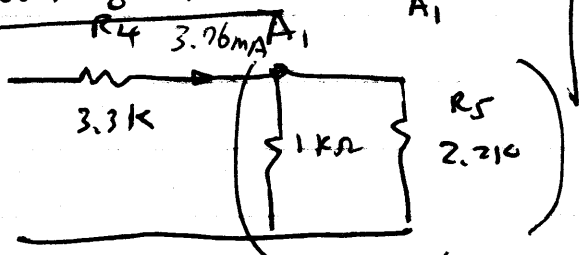
$10X1 + 5Y_1 = 20$

$5X1 - 10Y_1 = 5$

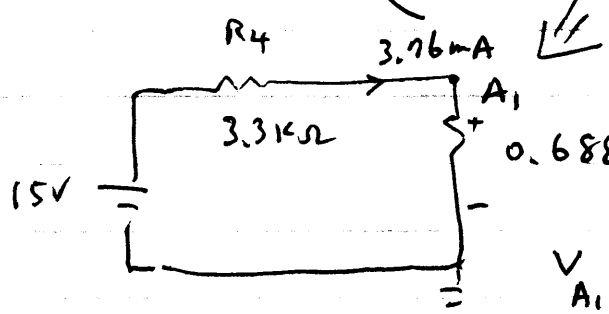
* Determinant method.

* matrix

15V working Alone $\Rightarrow V'_{A_1}$



$V'_{A_1} = 2.587\ V$



$V_{A_1} = 3.76mA * 0.688K\Omega = 2.587$ volt

= ~~0.14 volt~~

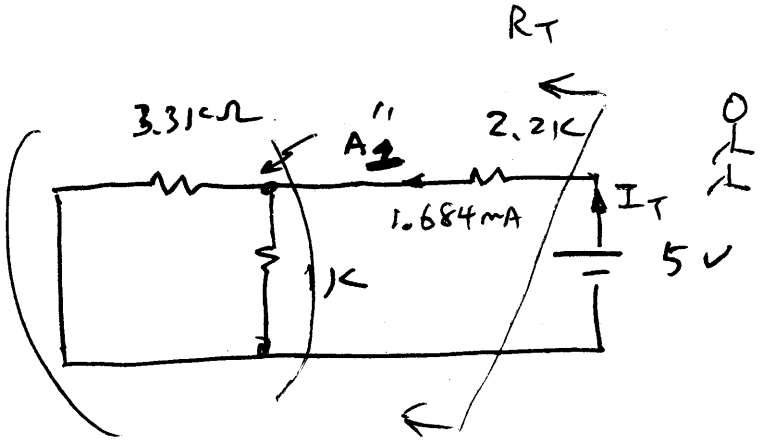
KVL

$15V = (3.3K \cdot 3.76mA) + V'_{A_1}$

$= 12.4 + 2.587$

$\approx 15V$

5V working Alone $\Rightarrow V''_{A_1}$



$$R_T = 2.2K + (1K \,||\, 3.3K)$$

$$= 2.2K + \frac{1K \times 3.31K}{1K + 3.3K}$$

$$= 2.2K + 0.7674\ K\Omega$$

$$= 2.9674\ K\Omega$$

$$I_T = \frac{5V}{R_T} = \frac{5V}{2.9674_{K\Omega}} \doteq \frac{5V}{2.97_{K\Omega}} = 1.684\ mA$$

$$V_{A_1}'' = I_T \cdot (3.3K \,||\, 1K\Omega)$$

$$= 1.684mA * 0.7674\ K\Omega = 1.29\ volt$$

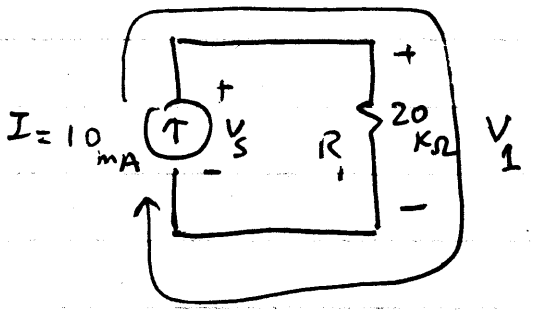
$m \times K = 1$

$$V_A = V_{A_1}' + V_{A_1}''$$

$$= 2.587V + 1.29V$$

$$= 3.88V$$ *

Ex 8-1



Ohm's Law

Voltage drop across R_1

$V_1 = I \cdot R_1 = 200$ Volt.

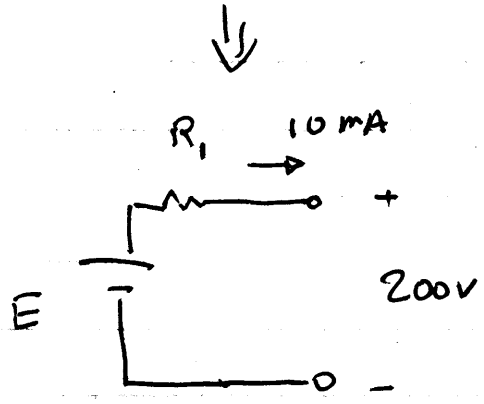
$= 10\ mA \cdot 20\ K\Omega$

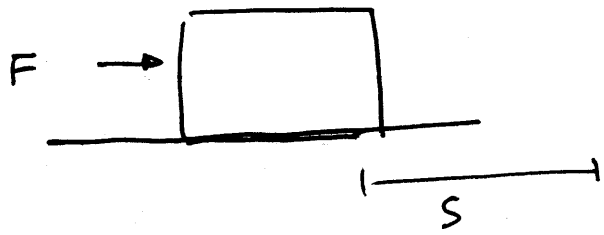
$= 10 \times 10^{-3} A \times 20 \times 10^{3}\ \Omega$

$10^{-3} \cdot 10^{3} = 10^{0} = 1$

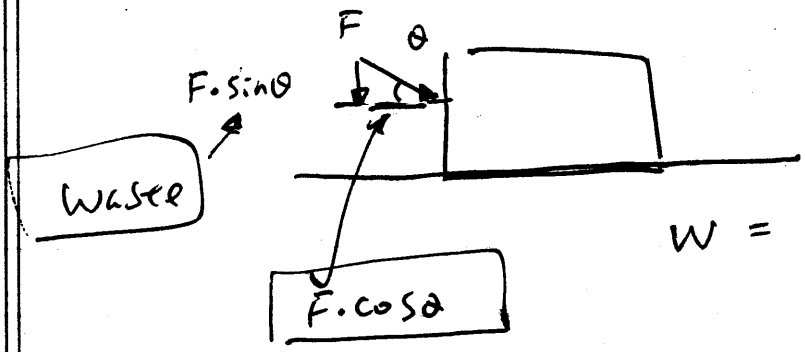
KVL $V_s = ?$

$= V_1 = 200V$



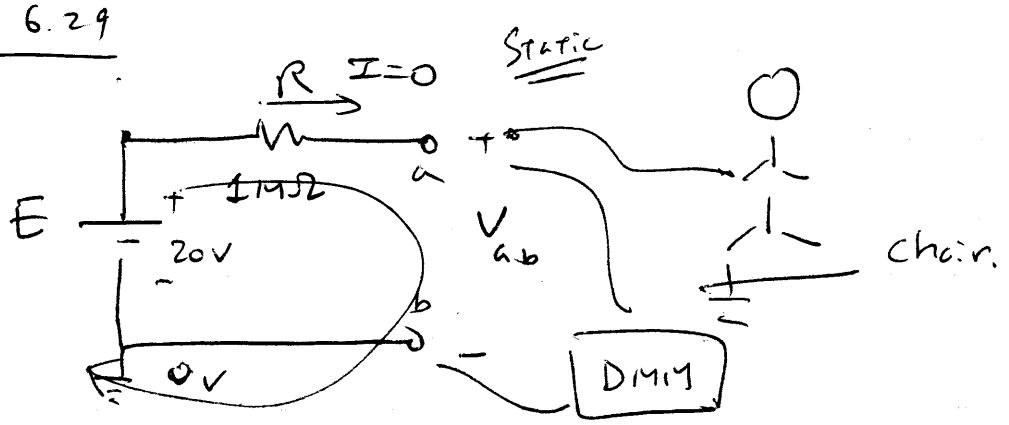


$W = F \cdot S$



$W = F \cdot S \cdot \cos\theta$

Ex 6.29



$$V_{ab} = V_a - V_b$$

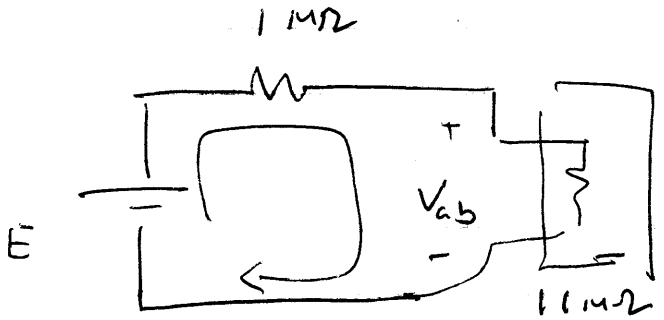
$$= V_a - 0$$

$\because I = 0 \quad \therefore V_a = E = 20V$

KVL

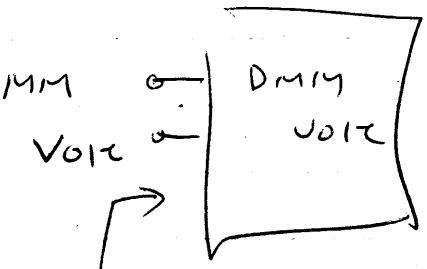
$$E = I \cdot R + V_{ab}$$ (0V)

$$E = V_{ab} = 20V$$



KVL

Voltage Divider Rule



Vacuum Tube

$R_i = \infty$

VDR

$$V_{ab} = \left(\frac{11M\Omega}{11M + 1M}\right)E = 20 \cdot \frac{11}{12} = 18.33V$$

KVL

$$E = I \cdot 1M + I \cdot 11M\Omega$$

$$I = \left(\frac{E}{11M\Omega}\right) \Rightarrow 11M\Omega$$