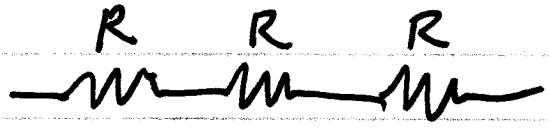
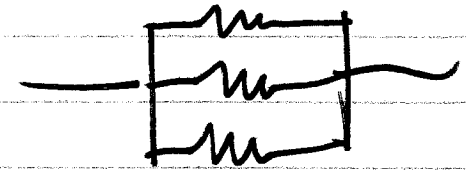
Phys 2426 2014-09-22

$$R = \rho \frac{l}{A}$$



$= 3R$

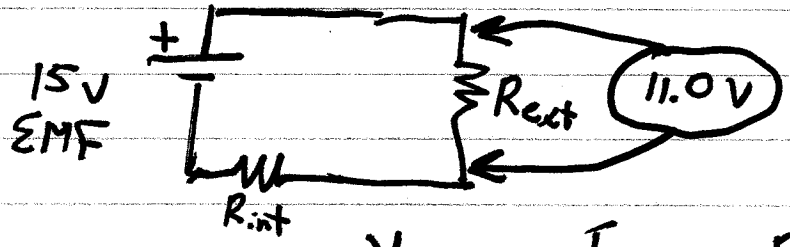
9x smaller



$= \frac{R}{3}$

$V = IR$ $\quad P = IV = I^2R = \frac{V^2}{R}$

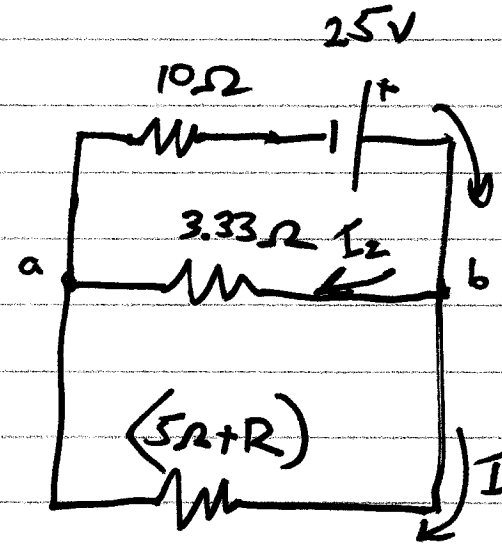
often loss of R is internal or transmission



	V	I	R	P
R_{int}				
R_{ext}	11.0 V			16.0 W
Tot	15 V			

$$I = \frac{P_{device}}{\sqrt{\blacksquare_{device}}}$$

(2)



① $I_1 = I_2 + I_3$

② $+25 - 3.33 I_2 - 10 I_1 = 0$

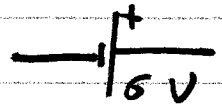
③ $+25 - (5+R) I_3 - 10 I_1 = 0$

Kirchoff's Laws

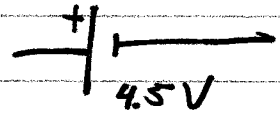
$\Sigma I_{in} = \Sigma I_{out}$ $\qquad \sum_{loop} \Delta V = 0$

KVL:
- Choose a looped path. (Hint: try to follow the I arrows)
- Itemize the devices along the loop.
- Fill in ΔV for each.

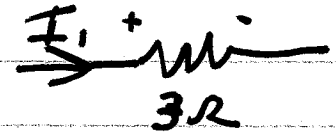
Devices (with my path going ····→)



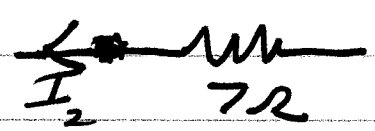
$\Delta V = +6V$



$\Delta V = -4.5V$



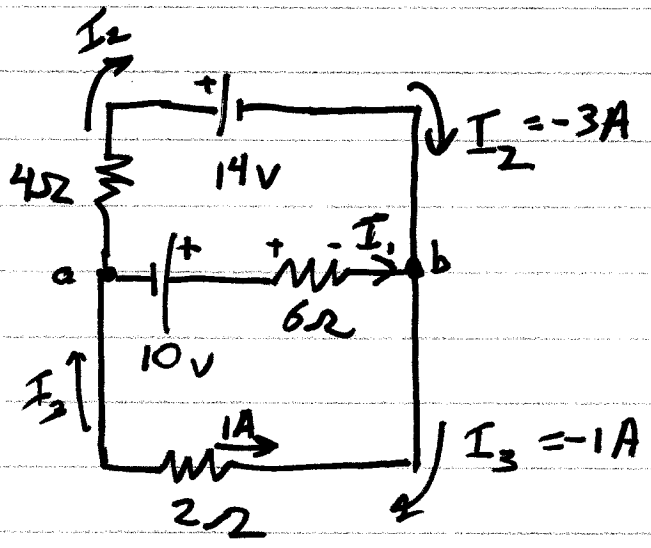
$\Delta V = -3 I_1$



$\Delta V = +7 I_2$

(3)

Ex 28.7, p. 845.



(Eq 1) $I_1 + I_2 = I_3$

Lower Loop:

$\Sigma \Delta V = 0$

(Eq 2) $0 = +10 - 6I_1 - 2I_3$

(Eq 3) $0 = -14 - 2I_3 - 4I_2$

1. Solve for a variable in one eqn.
2. Plug it into the others.

(Eq 2) → $0 = +10 - 6I_1 - 2(I_1 + I_2) = 10 - 8I_1 - 2I_2$ (4)

(Eq 3) → $0 = -14 - 2(I_1 + I_2) - 4I_2 = -14 - 2I_1 - 6I_2$ (5)

(4) → $2I_2 = 10 - 8I_1 \rightarrow I_2 = 5 - 4I_1$

(5) → $0 = -14 - 2I_1 - 6(5 - 4I_1)$

$0 = -44 + 22I_1$

$I_1 = (2A)$

$I_2 = (-3A)$

$I_3 = (2A) + (-3A) = (-1A)$