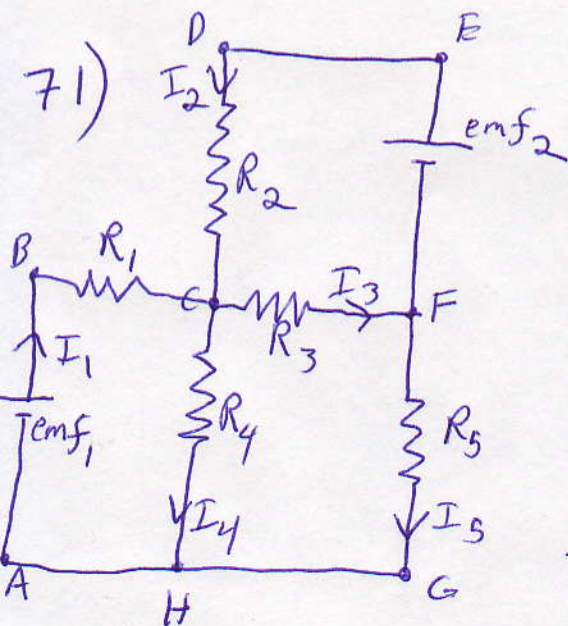
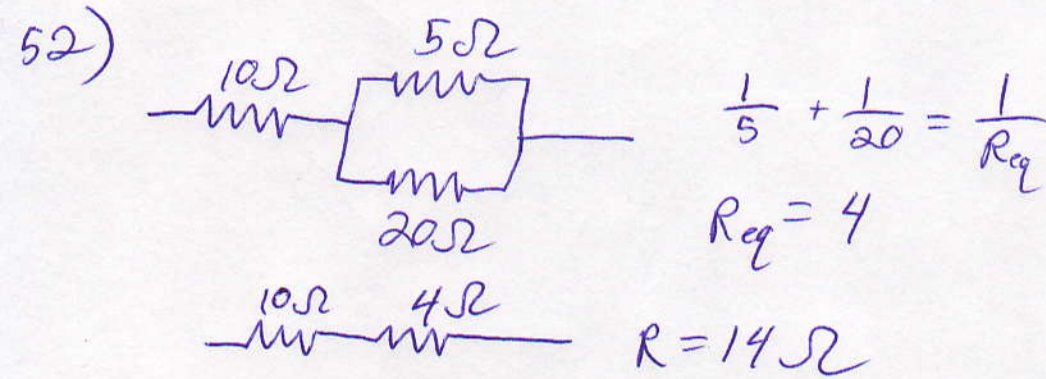


HW3 ^{ch19} 47, 52, 66, 67, 69, 71, 73
pdf

47) $I_{\text{battery}} = .2 \text{ A}$

$I_{2\text{battery}} = .33 \text{ A}$ not $.4 \text{ A}$ why?

The batteries have an internal resistance that affects the current.



5 currents
5 resistors
2 emf

mode C

$I_2 + I_1 = I_3 + I_4$

mode F

$I_3 = I_2 + I_5$

mode H

$I_1 = I_4 + I_5$

loop BCFGHA

$-I_1 R_1 - I_3 R_3 - I_5 R_5 + emf_1 = 0$

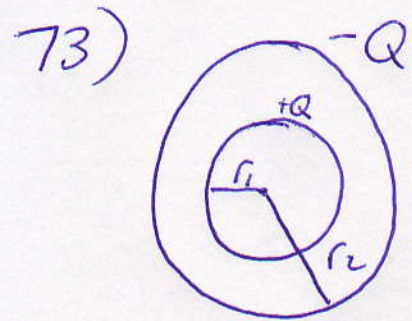
loop D E F G H C

$-emf_2 - I_5 R_5 + I_4 R_4 + I_2 R_2 = 0$

5 equations and 5 unknowns ✓

71 b) $V_D - V_A = -I_2 R_2 + I_1 R_1 - \text{emf}_1$
(there are many ways to solve this one)

c) $P = I_2 \text{emf}_2$



$$Q = C |\Delta V|$$

$$\Delta V = E s$$

$$s = r_2 - r_1$$

$$\frac{Q}{|E s|} = C$$

$$E = \frac{Q}{A \epsilon_0}$$

$$C = \frac{Q}{|E s|} = \frac{Q}{\left| \frac{Q}{A \epsilon_0} s \right|} = \frac{A \epsilon_0}{s}$$