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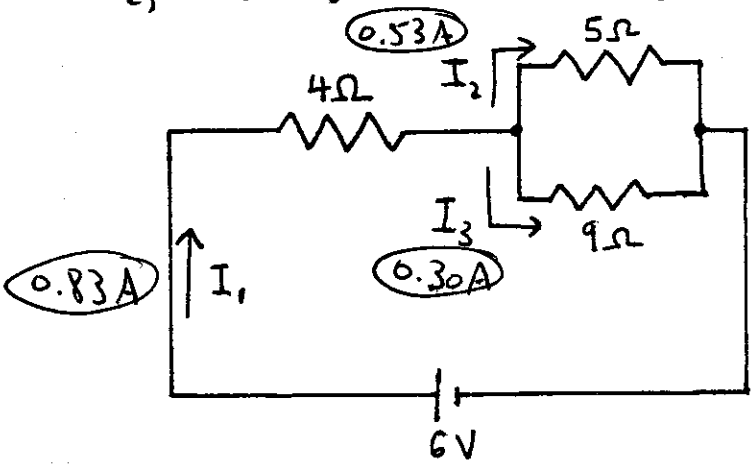
Phys 122-401
10/10/06

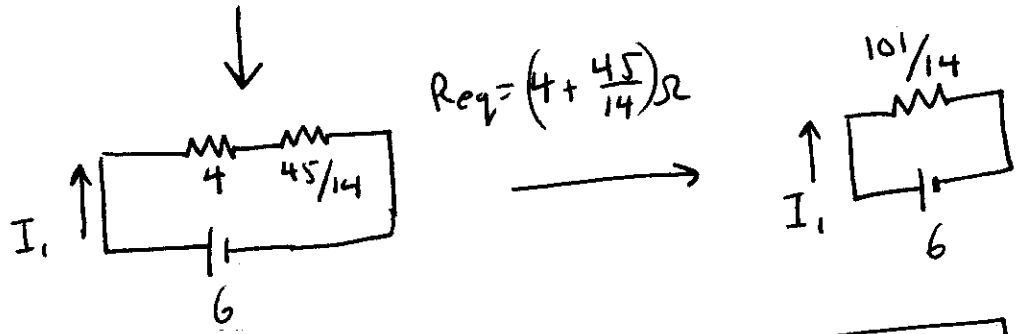
QUIZ 5: Electric Current

Use Kirchoff's rules to find the current I_1, I_2, and I_3 in the circuit shown.



$$\frac{1}{R_{eq}} = \frac{1}{5\Omega} + \frac{1}{9\Omega}$$

$$\Rightarrow R_{eq} = 45/14\ \Omega$$



$$\Rightarrow I_1 = \frac{\Delta V}{R_{eq}} = \frac{6V}{(101/14\ \Omega)} = \boxed{0.83A}$$

ΔV_4 = voltage drop across 4Ω resistor

$$\Delta V_4 = I_1 R_4 = (0.83A)(4\Omega) = 3.327V$$

so $\Delta V_5 = \Delta V_9 = 6V - 3.327\ V = 2.673V$

by Kirchoff loop law

$$\Rightarrow I_2 = \frac{\Delta V_5}{R_5} = \frac{2.673V}{5\Omega} = \boxed{0.53A}$$

by Kirchoff junction rule: $I_3 = I_1 - I_2 = \boxed{0.30A}$