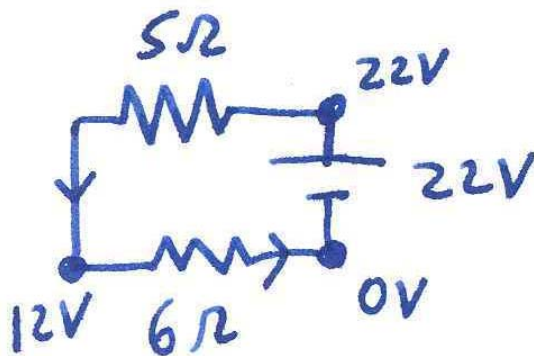


HOMEWORK for JUNE 30, 2005

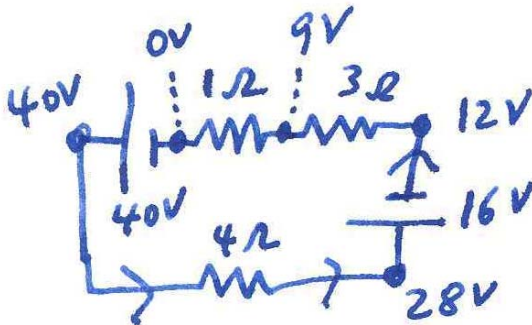
For the following circuits, draw the circuit and fill out the $R - I - \Delta V - P$ table (including the battery or batteries). Also mark a point between each pair of circuit elements (resistors or batteries) and determine the electric potential at that point; let the negative terminal of the largest battery be set at zero potential. Also indicate the direction of the electric current in each circuit.

1. A series circuit consisting, in order, of a $5\text{-}\Omega$ resistor, a 22-volt battery going $+$ to $-$, and a $6\text{-}\Omega$ resistor.



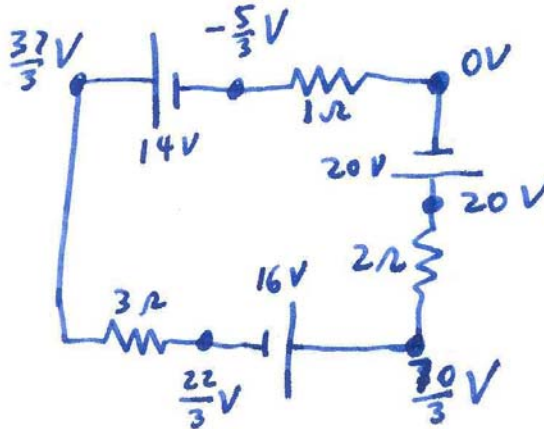
R	I	ΔV	P
$5\ \Omega$	$2\ \text{A}$	$10\ \text{V}$	$20\ \text{W}$
$6\ \Omega$	$2\ \text{A}$	$12\ \text{V}$	$24\ \text{W}$
$11\ \Omega$	$2\ \text{A}$	$22\ \text{V}$	$44\ \text{W}$

2. A series circuit consisting, in order, of a 40-V battery going $+$ to $-$, a $1\text{-}\Omega$ resistor, a $3\text{-}\Omega$ resistor, a 16-V battery going $-$ to $+$, and a $4\text{-}\Omega$ resistor.



R	I	ΔV	P
$1\ \Omega$	$3\ \text{A}$	$3\ \text{V}$	$9\ \text{W}$
$3\ \Omega$	$3\ \text{A}$	$9\ \text{V}$	$27\ \text{W}$
$4\ \Omega$	$3\ \text{A}$	$12\ \text{V}$	$36\ \text{W}$
	$3\ \text{A}$	$40\ \text{V}$	$120\ \text{W}$
	$3\ \text{A}$	$-16\ \text{V}$	$-48\ \text{W}$

3. A 14-V battery going + to -, a 1-Ω resistor, a 20-V battery going - to +, a 2-Ω resistor, a 16-V battery going + to -, and a 3-Ω resistor.



R	I	ΔV	P
$1\ \Omega$	$5/3\ \text{A}$	$5/3\ \text{V}$	$25/9\ \text{W}$
$2\ \Omega$	$5/3\ \text{A}$	$10/3\ \text{V}$	$50/9\ \text{W}$
$3\ \Omega$	$5/3\ \text{A}$	$5\ \text{V}$	$25/3\ \text{W}$
	$5/3\ \text{A}$	$14\ \text{V}$	$70/3\ \text{W}$
	$5/3\ \text{A}$	$-20\ \text{V}$	$-100/3\ \text{W}$
	$5/3\ \text{A}$	$16\ \text{V}$	$80/3\ \text{W}$

Total power dissipated in resistors = $50/3\ \text{W}$, same as the net power supplied by the three batteries.