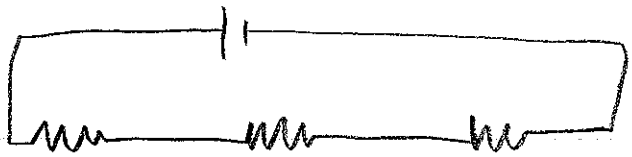
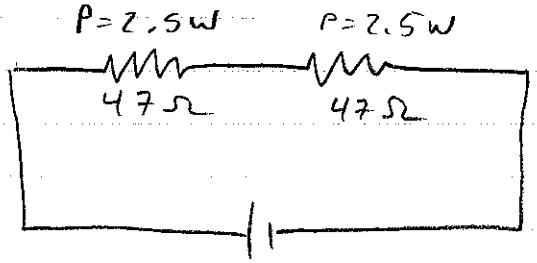
Circuits Worksheet

(1)



R:	25Ω	45Ω	75Ω	$V = IR$
I:	.5A	.5A	.5A	
V:	12.5V	22.5V	37.5V	

(2)



$R_T = 47 + 47 = 94\Omega$

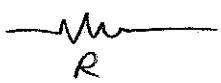
$P_T = 2.5 + 2.5 = 5W$

$$P = \frac{V^2}{R}$$

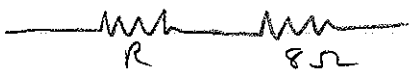
$$5 = \frac{V^2}{94}$$

$$V = 21.7V$$

(3)



$I = 15A$



$I = 12A$

The voltage would be the same for both circuits (we are adding to 8Ω resistor)

$V = IR$

$$15(R) = 12(R + 8)$$

$$15R = 12R + 96$$

$$3R = 96$$

$$R = 32\Omega$$

(4) $\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2}$

$\frac{1}{115} = \frac{1}{155} + \frac{1}{R_2}$

$.00244 = \frac{1}{R_2}$

$R_2 = 446\ \Omega$

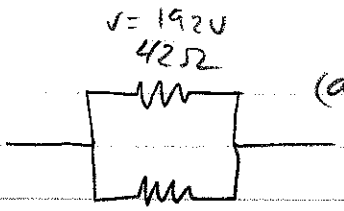
(5) $\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \cdots$

$\frac{1}{R_p} = N\left(\frac{1}{R}\right)$

$\frac{1}{.063} = N\left(\frac{1}{4}\right)$

$N = 64$ (we must round up to the nearest whole number, you can't have a fraction of a resistor)

(6)



(a) $I = 4.6\ A$

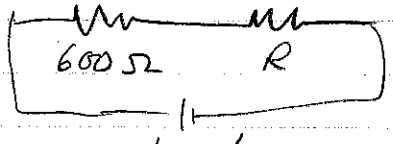
(b) Total $I = 3 + 4.6 = 7.6\ A$

$P = IV$

$= (7.6)(192)$

$= 1459\ W$

(7)



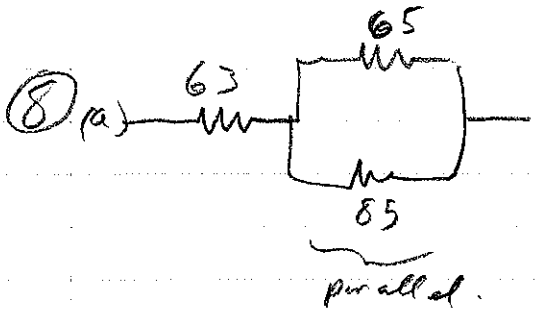
$P = \frac{V^2}{R}$ $\quad 18 = \frac{(120)^2}{(600+R)}$

$18(600+R) = 14400$

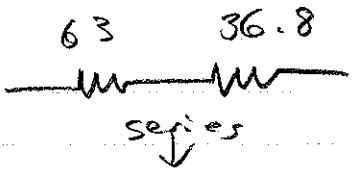
$10800 + 18R = 14400$

$R = 200\Omega$

(8) (a)

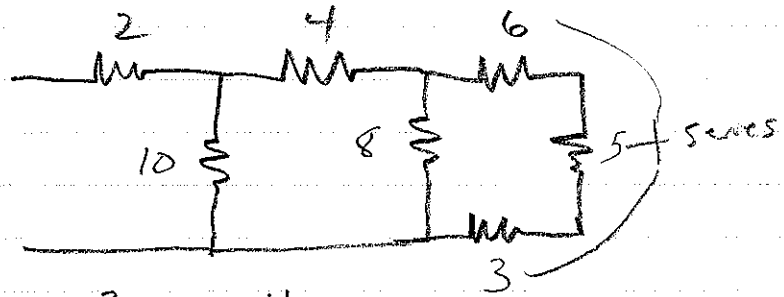


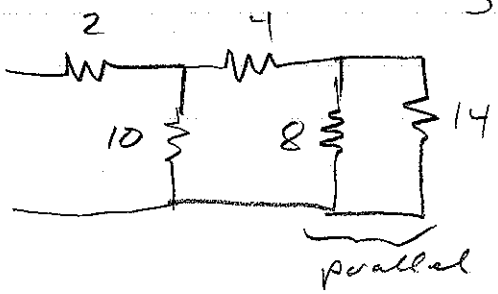
parallel.

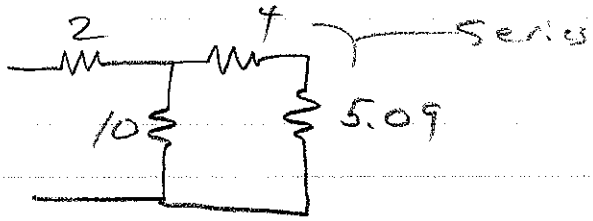


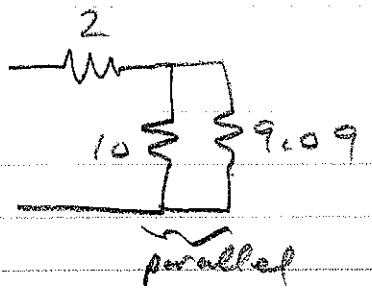
$R = 99.8\ \Omega$

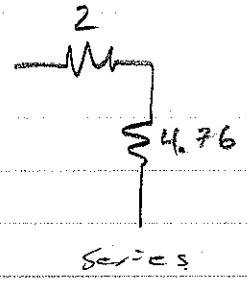
(b)





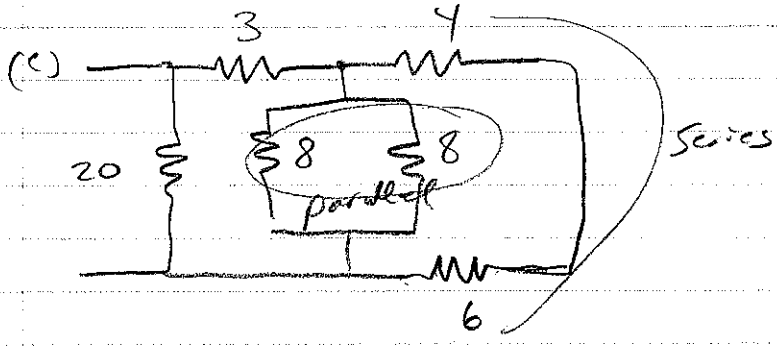


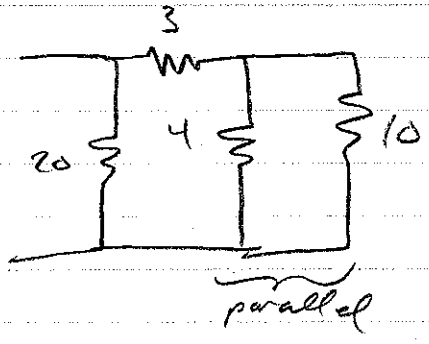




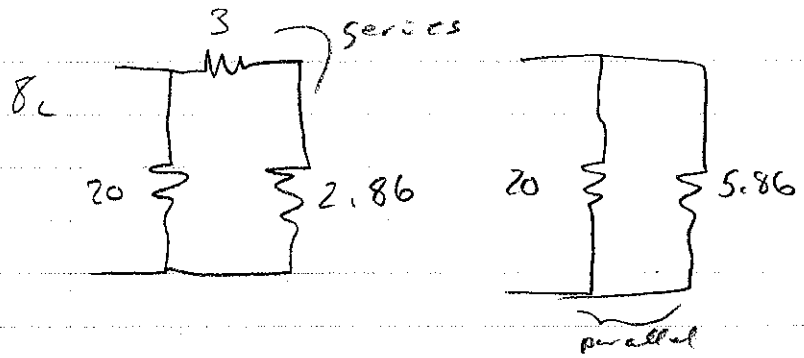
$R = 6.76$

(c)



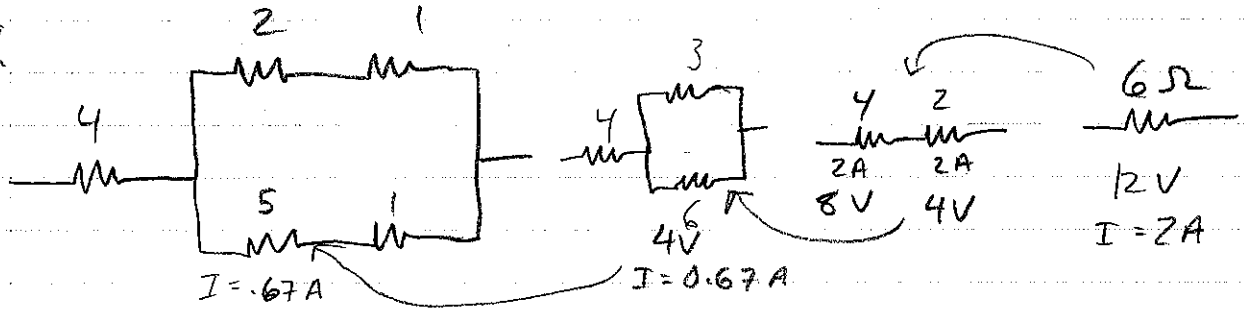


8.



$R = 4.5\ \Omega$

9.



$P = I^2R = (0.67)^2 5 = \underline{2.2\,W}$

(10) $V_8 = .5(8) = 4V$

So $V_{16} = 4V$ + $I_{16} = \frac{4}{16} = .25A$

current through 20Ω = $.5A + .25A = .75A$

$V_{20} = (.75)(20) = 15V$

$V_{9\Omega} + V_{18\Omega} = V_{20\Omega} + 4V = 19V$

So $I_{9\Omega} = \frac{19}{9} = \underline{2.11\,V}$