Name _____ Period ___ Date _____

Series and Parallel Practice Corrections

Due Tuesday 3/28 as you enter class

1. Check your answers with the solutions listed online
2. Print or Draw the Corrections Table below. Complete the Corrections Table

Question #	Concept Assessed Include the Equation	My misconception	What I learned from this

1. A 45Ω (R_1) resistor and a 15Ω (R_2) motor are connected in parallel with a switch to a 50V battery

a)

b) $\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \dots$

$\frac{1}{R_T} = \frac{1}{45} + \frac{1}{15}$

$\frac{1}{R_T} = .0\overline{2} + .06$

$\frac{1}{R_T} = .0\overline{8}$ flip

$R_T = \frac{1}{.0\overline{8}} = 11.25\Omega$ ~~12.55Ω~~

c) $I_T = I_1 + I_2 + \dots$

$V = IR \quad I = \frac{V_T}{R_T}$

$I_1 = \frac{V_1}{R_1} = \frac{50}{45} = 1.\overline{1}A$

$I_2 = \frac{V_2}{R_2} = \frac{50}{15} = 3.\overline{3}A$

$I_T = 4.4\overline{4}A$

d) battery $V_T = V_1 = V_2$

$V_T = I_T R_T$

$V_T = 4.44(11.25)$

$V_T = 49.\overline{9} = 50V$ = battery

e) $P = IV$

$P_1 = I_1 V_1 = (1.\overline{1})(50) = 55.56W$

$P_2 = I_2 V_2 = (3.\overline{3})(50) = 166.7W$

$222.26W$

f) $P_T = I_T V_2$

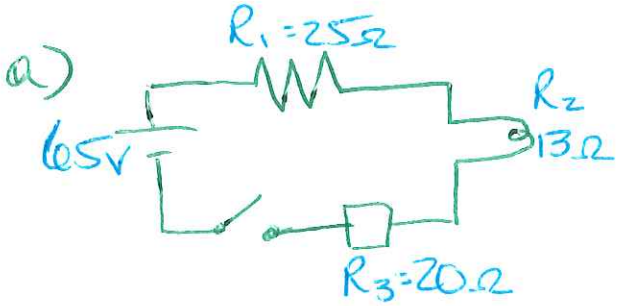
$P_T = 4.4\overline{4}(50) = 222.\overline{2}W$

OR

$P_T = P_1 + P_2 + \dots$

2. A R_1 25 Ω resistor, R_2 13 Ω lamp, and a R_3 20 Ω motor are connected in parallel to a 65 V battery

a)



b) $\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$

$\frac{1}{R_T} = \frac{1}{25} + \frac{1}{13} + \frac{1}{20}$

$\frac{1}{R_T} = .04 + .0769 + .05$

$\frac{1}{R_T} = \frac{0.16669}{1}$ flip

$\frac{R_T}{1} = \frac{1}{0.16669} = 5.992\,\Omega$

c) $I_T = I_1 + I_2$

$V_1 = I_1 R_1 \quad I_1 = \frac{V_1}{R_1}$

$I_1 = \frac{65}{25} = 2.6A$

$I_2 = \frac{65}{13} = 5A$

$I_3 = \frac{65}{20} = 3.25A$

$I_T = 10.85A$

d) $V_T = V_1 = V_2 = \ldots$

$V_T = 65V$ = battery

e) $P = IV \quad P_T = P_1 + P_2 + \ldots$

$P_1 = I_1 V_1 = 2.6(65) = 169W$

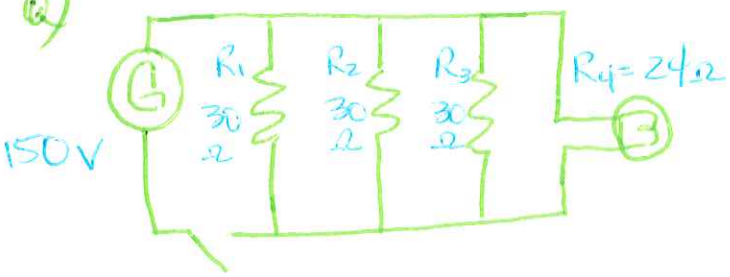
$P_2 = I_2 V_2 = 5(65) = 325W$

$P_3 = I_3 V_3 = 3.25(65) = 211.7W$

f) $P_T = P_1 + P_2 + P_3 \ldots$ → $P_T = 705.7W$

3. Three 30Ω resistors (R_1 R_2 R_3) and a 24Ω lamp (R_4) are connected in parallel with a switch to a 150V generator.

a)



b) $\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \frac{1}{R_4}$

$\frac{1}{R_T} = \frac{1}{30} + \frac{1}{30} + \frac{1}{30} + \frac{1}{24}$

$\frac{1}{R_T} = .0\bar{3} + .0\bar{3} + .0\bar{3} + .0416$

$\frac{1}{R_T} = \frac{.1416}{1}$ flip

$\frac{R_T}{1} = \frac{1}{.1416} = 7.058\Omega$

c) $I_T = I_1 + I_2 + I_3 \ldots$

$V = IR$

$I_1 = \frac{V_1}{R_1} = \frac{150}{30} = 5A$

$I_2 = \frac{V_2}{R_2} = \frac{150}{30} = 5A$

$I_3 = \frac{V_3}{R_3} = \frac{150}{30} = 5A$

$I_4 = \frac{V_4}{R_4} = \frac{150}{24} = 6.25A$

d) $V_T = V_1 = V_2 = \ldots$

$V_T = 150V$ = battery

e) $P = IV$

$P_1 = I_1 V_1 = 5(150) = 750W$

$P_2 = I_2 V_2 = 5(150) = 750W$

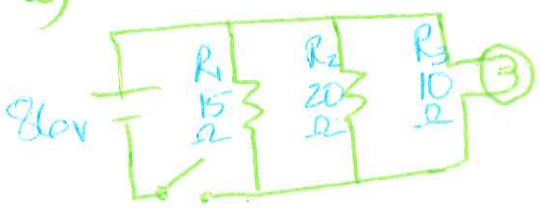
$P_3 = I_3 V_3 = 5(150) = 750W$

$P_4 = I_4 V_4 = 6.25(150) = 937.5$

f) $P_T = P_1 + P_2 + P_3 \ldots$ $\quad P_T = 3187.5W$

4. A 15 Ω (R_1) resistor, a 20 Ω (R_2) resistor, and a 10 Ω (R_3) lamp are connected in parallel with a switch to a 86 V battery

a)



b) $\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} \ldots$

$\frac{1}{R_T} = \frac{1}{15} + \frac{1}{20} + \frac{1}{10}$

$\frac{1}{R_T} = .06 + .05 + .1 = .21$

$\frac{1}{R_T} = \frac{.21}{1}$ flip $\frac{R_T}{1} = \frac{1}{.21} =$ 4.77 Ω

c) $I_T = I_1 + I_2 + I_3 \ldots$

$V = IR \quad I = \frac{V}{R}$

$I_1 = \frac{V_1}{R_1} = \frac{86}{15} =$ 5.73A

$I_2 = \frac{V_2}{R_2} = \frac{86}{20} =$ 4.3A

$I_3 = \frac{V_3}{R_3} = \frac{86}{10} =$ 8.6A

d) $V_T = V_1 = V_2$

V_T (86V) = battery

e) $P = IV$

$P_1 = I_1 V_1 = 5.73(86) =$ 492.78W

$P_2 = I_2 V_2 = 4.3(86) =$ 369.8W

$P_3 = I_3 V_3 = 8.6(86) =$ 739.6W

+

$P_T =$ 1602.18W

f) $P_T = P_1 + P_2 + P_3$