Name _____ Period ___ Date _____

Series and Parallel Practice Corrections

Due Tuesday 3/28 as you enter class

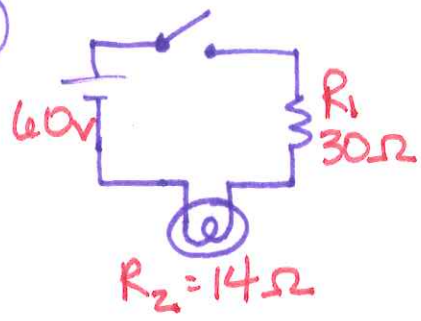
1. Check your answers with the solutions listed online
2. Print or Draw the Corrections Table below. Complete the Corrections Table

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

Circuit Practice

1. 30Ω (R_1) resistor + a 14Ω (R_2) lampare connected in series with a switch + 60v battery

a)



b) $R_T = R_1 + R_2 + \ldots$

$R_T = 30 + 14 = 44\Omega$

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

$V_T = I_T R_T$

$60 = I_T 44$

$I_T = \frac{60}{44} = 1.36A$

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

$V_1 = I_1 R_1$

$V_1 = 1.36(30) = 40.8v$

$V_2 = I_2 R_2$

$V_2 = 1.36(14) = 19.04v$

e) $P = I V$

$P_1 = I_1 V_1$

$P_1 = 1.36(40.8) = 55.48W$

$P_2 = I_2 V_2$

$P_2 = 1.36(19.04) = 25.89W$

f) $P_T = I_T V_T$

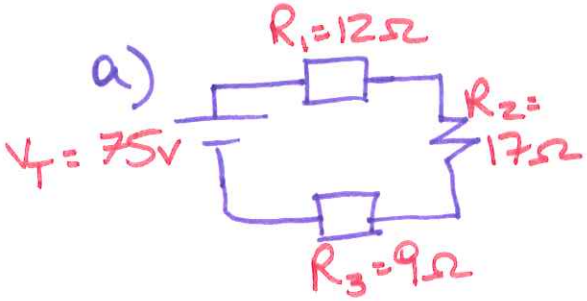
OR

$P_T = P_1 + P_2 + \ldots$

$P_T = 55.48 + 25.89 = 81.37W$

2. R_1 12Ω motor + a R_3 17Ω resistor + a R_3 9Ω motor are connected in ~~series~~ to a V_T 75V battery

a)



b) $R_T = R_1 + R_2 + \dots$

$R_T = 12 + 17 + 9 =$

$R_T = 38\Omega$

c) current is the same everywhere in series

$I_T = I_1 = I_2 = \dots$

$V_T = I_T \cdot R_T$ ← don't use R_1 be consistent $I_T = I_1$

$I_1 = I_T = \frac{V_T}{R_T} \quad \frac{75}{38} = 1.97A$

↑ don't use R_1

d) $V_T = V_1 + V_2 + \dots$

$V_1 = I_1 R_1$

$V_1 = (1.97)(12) = 23.64V$

$V_2 = (1.97)(17) = 33.49V$

$V_3 = (1.97)(9) = 17.73V$

e) $P = IV$

$P_1 = I_1 V_1 = (1.97)(23.64) = 46.57W$

$P_2 = I_2 V_2 = (1.97)(33.49) = 65.98W$

$P_3 = I_3 V_3 = (1.97)(17.73) = 34.93W$

$+$

$P_T = 147.48W$

f) $P_T = I_T V_T$

OR

$P_T = P_1 + P_2 + \dots$

c) $I_T = I_1 = I_2 = I_3$

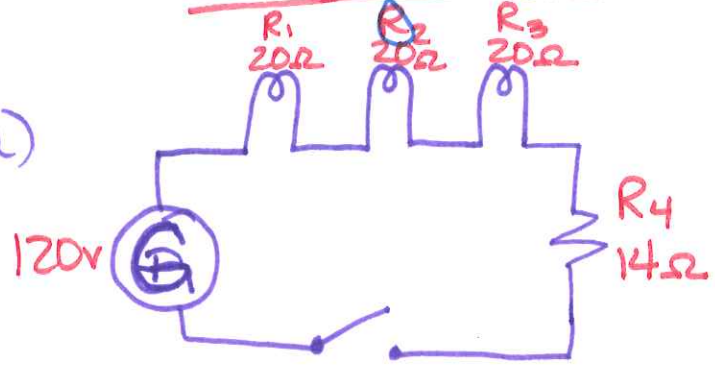
$V_1 = I_1 R_1$

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

$R_1 = R_2 = R_3$ R_4

3. Three 20Ω lamps and a 14Ω resistor are connected in series with a switch to a 120v generator.

a)



b) $R_T = R_1 + R_2 + \dots$

$R_T = 20 + 20 + 20 + 14$

$R_T = 74\Omega$

c) $I_T = I_1 = I_2$

$V = IR$

$I_T = \frac{V_T}{R_T} = \frac{120}{74} = 1.62A$

d) $V_T = V_1 + V_2 + \dots$

$V_1 = I_1 R_1$

$V_1 = (1.62)20 = 32.4v$

$V_2 = (1.62)20 = 32.4v$

$V_3 = (1.62)20 = 32.4v$

$V_4 = (1.62)14 = 22.68v$

e) $P = IV$

$P_1 = I_1 V_1 = (1.62)(32.4) = 52.488W$

$P_2 = I_2 V_2 = (1.62)(32.4) = 52.488W$

$P_3 = I_3 V_3 = (1.62)(32.4) = 52.488W$

$P_4 = I_4 V_4 = (1.62)(22.68) = 36.7416W$

$P_T = 194.21\ W$

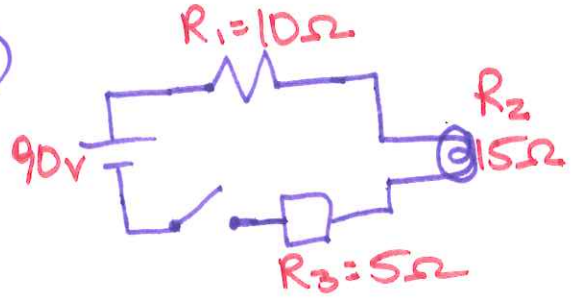
f) $P_T = I_T V_T$

OR

$P_T = P_1 + P_2$

4) A 10Ω (R_1) resistor, 15Ω (R_2) lamp, 5Ω (R_3) motor are connected in series with a switch and a 90v (V) battery

a)



b) $R_T = R_1 + R_2 + \dots$

$R_T = 10 + 15 + 5 = 30\Omega$

c) $I_T = I_1 = I_2$

$V = IR$

$I_2 = I_T = \frac{V_T}{R_T}$ $\frac{90}{30} = 3A$

d) $V_T = V_1 + V_2 + \dots$

$V = IR$

$V_1 = I_1 R_1 = 3(10) = 30v$

$V_2 = I_2 R_2 = 3(15) = 45v$

$V_3 = I_3 R_3 = 3(5) = 15v$

e) $P = IV$

$P_1 = I_1 V_1 = 3(30) = 90W$

$P_2 = I_2 V_2 = 3(45) = 135W$

$P_3 = I_3 V_3 = 3(15) = 45W$

$P_T = 270W$

f) $P_T = I_T V_T$

$P_T = 3(90) = 270$

10R

$P_T = P_1 + P_2 + \dots$