

Name: Key

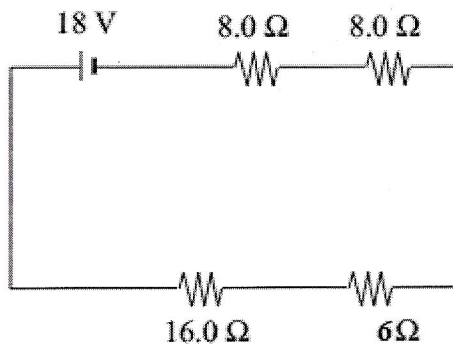
Period: _____ Date: _____

Electric Circuits problems 2

SERIES	PARALLEL
$V = V_1 + V_2 + V_3$	$V = V_1 = V_2 = V_3$
$I = I_1 = I_2 = I_3$	$I = I_1 + I_2 + I_3$
$R = R_1 + R_2 + R_3$	$\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$

I. Simplify the following electric circuits. Show your work to get full credit.

- Type of Circuit (Series/Parallel): Series
 - Total Resistance in the circuit: 38Ω
 - Current flowing in the circuit: 0.47A
 - Voltage for the 8Ω resistor: 3.76V
 - Voltage for the second 8Ω resistor: 3.76V
 - Voltage for the 6Ω resistor: 2.82V
 - Voltage for the 16Ω resistor: 7.52V
 - Power dissipated by the 16Ω resistor: 3.53W
 - Power dissipated by the 6Ω resistor: 1.33W

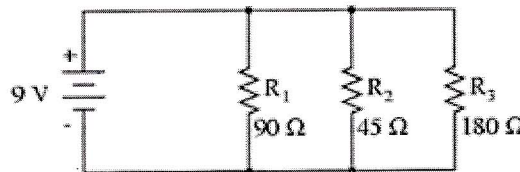


$P = I^2 R$
 h) $P = (0.47)^2 (16)$
 $P = 3.53W$
 i) $P = (0.47)^2 (6)$
 $P = 1.33W$

d) $R_T = 8 + 8 + 6 + 16 = 38\Omega$
 c) $I = \frac{V}{R} = \frac{18V}{38} = 0.47A$

d) $V_1 = IR_1 = (0.47)(8) = 3.76V$
 e) $V_2 = IR_2 = (0.47)(8) = 3.76V$
 f) $V_3 = IR_3 = (0.47)(6) = 2.82V$
 g) $V_4 = IR_4 = (0.47)(16) = 7.52V$

- Type of Circuit (Series/Parallel): Parallel
 - Total Resistance in the circuit: 25.71Ω
 - Current leaving the battery: 0.35A
 - Current flowing through the 90Ω resistor: 0.1A
 - Current flowing through the 45Ω resistor: 0.2A
 - Current flowing through the 180Ω resistor: 0.05A
 - Voltage drop for the 90Ω resistor: 9V
 - Voltage drop for the 45Ω resistor: 9V
 - Voltage drop for the 180Ω resistor: 9V



b) $\frac{1}{R_T} = \frac{1}{90} + \frac{1}{45} + \frac{1}{180}$
 $\frac{1}{R_T} = \frac{2+4+1}{180}$
 $\frac{1}{R_T} = \frac{7}{180}$
 $R_T = \frac{180}{7} = 25.71\Omega$

c) $I = \frac{V}{R} = \frac{9}{25.71}$
 $I = 0.35A$

d) $I = \frac{V}{R_1} = \frac{9}{90} = 0.1A$
 $I = \frac{V}{R_2} = \frac{9}{45} = 0.2A$
 $I = \frac{V}{R_3} = \frac{9}{180} = 0.05A$