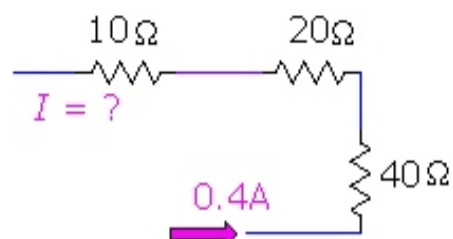# Physics 3204

Unit 2: Section 2 -Current Electricity
Worksheet 6: SERIES CIRCUIT

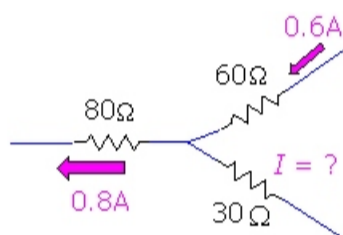1. For the circuit portion shown below the current through the 40Ω resistor is 0.4A. What is the current through the 10Ω resistor?

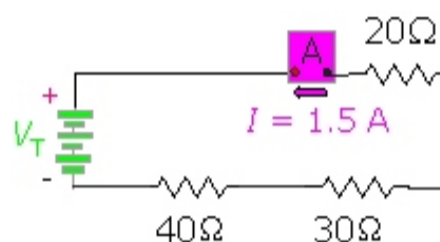   (A)   0.1 A
    (B)   0.2 A
    (C)   0.3 A
    (D)   0.4 A

2. For the circuit portion shown below the current through the 60Ω resistor is 0.6A; the current through the 80Ω is 0.8A. What is the current through the 30Ω resistor?

    (A)   0.3 A
    (B)   0.2 A
    (C)   1.4 A
    (D)   0.6 A

3. The circuit diagram shows 3 resistors connected in series with a battery. The ammeter reads 1.5 A. What is the voltage of the battery?

    (A)   135 V
    (B)   45 V
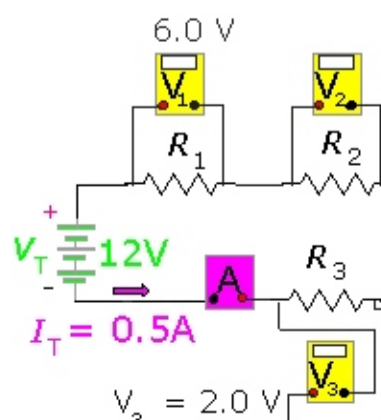   (C)   60 V
    (D)   14 V

4. In the diagram below an unknown resistor is connected in series with 2 known resistors. The voltage across the unknown resistor is 4V and the current through the unknown resistor is 0.2A. What is the voltage of the battery?

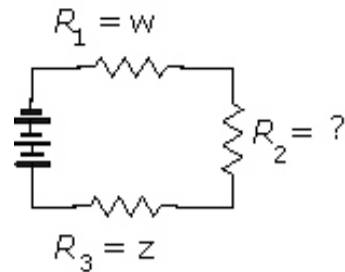   (A)   34 V
    (B)   44 V
    (C)   12 V
    (D)   24 V

5. Use the information in the schematic to determine the value of R_2.

    (A)   4 Ω
    (B)   2.0 Ω
    (C)   6.0 Ω
    (D)   8 Ω

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6.	In the branch to the right the total resistance is T ohms. What is value of R_2?

(A)	T + w + z
(B)	T - w - z
(C)	T - w + z
(D)	(w + z) - T

$R_1 = w$

$R_2 = ?$

$R_3 = z$

7.	If four 20 Ω resistors are connected in series, what is the equivalent resistance?

(A)	5 Ω
(B)	10 Ω
(C)	20 Ω
(D)	80 Ω

8.	What is the total resistance when a 12 Ω and 15 Ω resistor are connected in parallel?

(A)	0.037 Ω
(B)	0.15 Ω
(C)	6.7 Ω
(D)	27 Ω

9.	What is the voltage drop across R_1 in the circuit below?

(A)	4.5 V
(B)	9.0 V
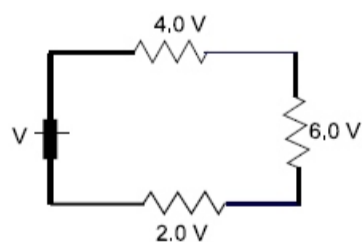(C)	11 V
(D)	15 V

$V_T = 45$ V

$R_1 = 10.0$ Ω

$R_2 = 15.0$ Ω

$R_3 = 25.0$ Ω
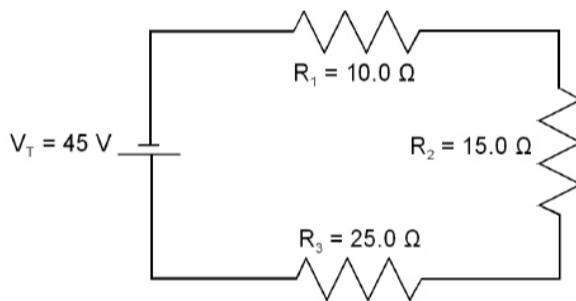
10.	What is the voltage drop across one of three identical resistors that are connected in series to a 6.0 V source?

(A) 2.0 V
(B) 3.0 V
(C) 6.0 V
(D) 18 V

11.	What is the voltage, V, across the source for the circuit below?

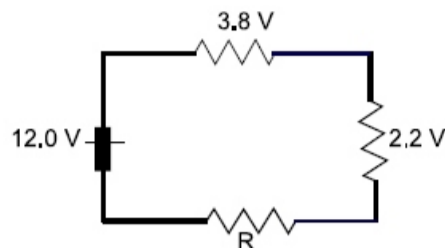(A)	1.1 V
(B)	4.0 V
(C)	6.0 V
(D)	12.0 V

4,0 V

V

6,0 V

2.0 V

12.	Who proposed that around any closed path, the sum of the voltage rises is equal to the sum of the voltage drops?

(A)	Coulomb
(B)	Kirchoff
(C)	Ohm
(D)	Voltaire

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13. What value of resistor, R, must be added in the circuit below to give a total resistance of 32 Ω?

    (A)   2.0 Ω
    (B)   8.0 Ω
    (C)   16 Ω
    (D)   26 Ω

14. If a 2.0 Ω, 4.0 Ω, and 6.0 Ω resistor are connected in series with a 24 V battery, what is the potential difference across the 2.0 Ω resistor?

    (A)   4.0 V
    (B)   8.0 V
    (C)   12 V
    (D)   24 V

15. If a series circuit contains two 15 Ω light bulbs, three 25 Ω light bulbs, and a 24 V battery, how much current passes through each bulb?

    (A)   0.15 A
    (B)   0.23 A
    (C)   0.60 A
    (D)   1.7 A

16. A string of 20 identical lights is connected in series across a 120 V source, and each light consumes 2.4 W. What is the resistance of each bulb?

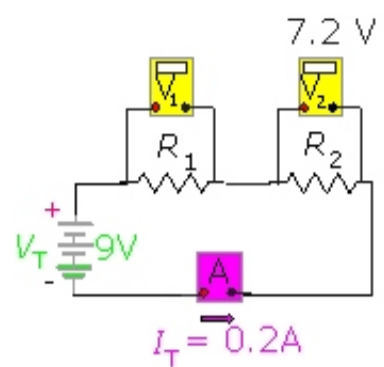   (A)   6.0 Ω
    (B)   15 Ω
    (C)   48 Ω
    (D)   120 Ω

1. For the circuit branches shown, what is the current through the 10Ω resistor?   [2]
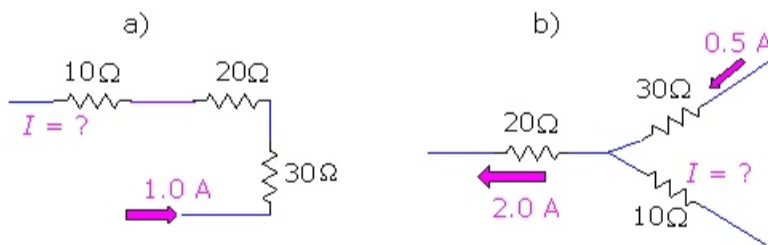
2. An ammeter connected between the two resistors in the diagram to the right reads 0.4 A. What is the voltage of the battery?   [2]

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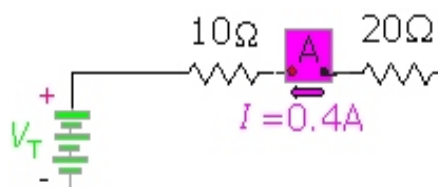
3.   According to the parameters in the circuit to the right, what is the value of R_1?

[2]

7.2 V

R_1 R_2

V_T 9V

A

$I_T = 0.2A$

4.   Calculate each of the following:

(A)   The equivalent resistance of three $8\,\Omega$ resistors in series   [1]

(B)   The total resistance of a series circuit is $76\,\Omega$. If two of the resistors are $22\,\Omega$ and $16\,\Omega$, what is the value of the third resistor?   [2]