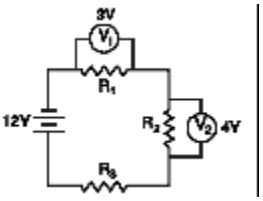
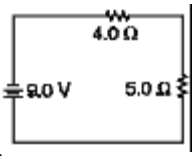
94 The diagram at right shows three resistors, R_1, R_2, and R_3, connected to a 12-volt battery.
If voltmeter V_1 reads 3 volts and voltmeter V_2 reads 4 volts, what is the potential drop across resistor R_3?
(1) 12 V (2) 5 V
(3) 0 V (4) 4 V

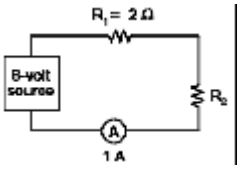


95 A 9.0-volt battery is connected to a 4.0-ohm resistor and a 5.0-ohm resistor as shown in the diagram below.
What is the current in the 5.0-ohm resistor?
(1) 1.0 A (2) 1.8 A (3) 2.3 A (4) 4.0 A



Hint: In a series circuit, current is the same in all parts of the circuit and is equal to the total current.

96 The circuit shown at right contains two resistors, R_1 and R_2.
What is the resistance of resistor R_2?

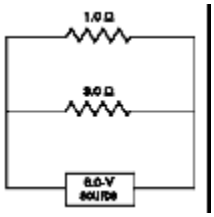


97 In the circuit shown at right, voltmeter V_2 reads 80. volts.
What is the reading of voltmeter V_1?
(1) 160. V (2) 80. V (3) 40. V (4) 20. V

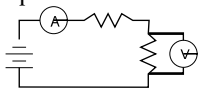
98 In question 97, the circuit is
(1) a series circuit with voltmeter in parallel
(2) a series circuit with voltmeter in series
(3) parallel circuit with voltmeter in parallel

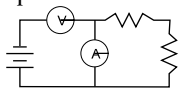
99 A 20.-ohm resistor and a 30.-ohm resistor are connected in parallel to a 12-volt battery as shown. An ammeter is connected as shown at right.
What is the equivalent resistance of the circuit?
(1) 10. Ω (2) 12 Ω (3) 25 Ω (4)50. Ω

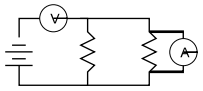
100 The diagram at right shows two resistors connected in parallel across a 6.0-volt source. The equivalent resistance of the two resistors is
(1) 0.75 Ω (3) 1.3 Ω
(2) 2.0 Ω (4) 4.0 Ω

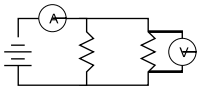


101 Which circuit shown below could be used to determine the total current and potential difference of a parallel circuit?

(1) 

(3) 

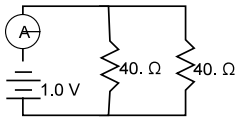
(2) 

(4) 

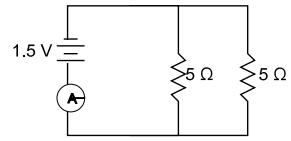
102 Which circuit diagram below correctly shows the connection of ammeter A and voltmeter V to measure the current through and potential difference across resistor R?

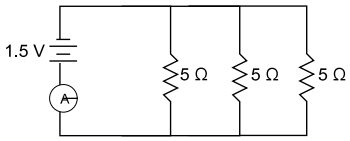
106 A physics student is given three 12-ohm resistors with instructions to create the circuit that would have the lowest possible resistance. The correct circuit would be a
(1) series circuit with a total resistance of 36 Ω
(2) series circuit with a total resistance of 4 Ω
(3) parallel circuit with a total resistance of 36 Ω
(4) parallel circuit with a total resistance of 4 Ω

107 In the circuit diagram at right, ammeter *A* measures the current supplied by the 10.-volt battery. The current measured by the ammeter *A* is
(1) 0.13 A (3) 0.50 A
(2) 2.0 A (4) 4.0 A



Base your answers to questions 108 and 109 on the circuit drawings below.

(1)


(2)


108 Find the current in circuit *1* and in circuit *2*.

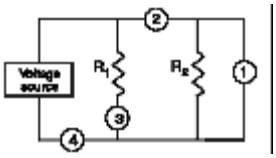
109 By looking at the two circuits, how can you tell which circuit has more current?

110 An electric circuit contains an operating heating element and a lit lamp. Which statement best explains why the lamp remains lit when the heating element is removed from the circuit?
(1) The lamp has less resistance than the heating element.
(2) The lamp has more resistance than the heating element.
(3) The lamp and heating element were connected in series.
(4) The lamp and heating element were connected in parallel.

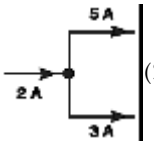
Hint: A heating element is a resistor, just like a bulb is a resistor.

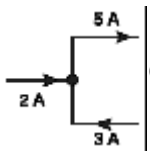
111 Four lamps are connected in parallel. If one lamp burns out, the current and brightness of the other lamps
(1) increase (2) decrease (3) remain the same

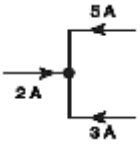
112 Two resistors are connected to a source of voltage as shown in the diagram at right. At which position should an ammeter be placed to measure the current passing only through resistor R_1?
(1) 1 (2) 2 (3) 3 (4) 4

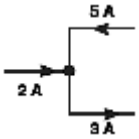


113 Which diagram shows correct current direction in a segment of an electric circuit?

(1)


(2)


(3)


(4)


CONSTRUCTED RESPONSE QUESTIONS: Parts B-2 and C of NYS Regents Exam

158 In the space provided *on your answer paper*, draw a diagram of this circuit, using the symbols with labels given below. [Assume availability of any number of wires of negligible resistance.]

159 Determine the total resistance. [Show all calculations, including the equation and substitution with units.]

160 Determine the total circuit current. [Show all calculations, including the equation and substitution with units.]

Base your answers to questions 161-165 on the information and data table below.

Three lamps were connected in a circuit with a battery of constant potential. The current, potential difference, and resistance for each lamp are listed in the data table below. [There is negligible resistance in the wires and the battery.]

	Current (A)	**Potential Difference** (V)	**Resistance** (Ω)
lamp 1	0.45	40.1	89
lamp 2	0.11	40.1	365
lamp 3	0.28	40.1	143

Hint: Use symbol for lamp given on **Reference Table: Circuit Symbols**.

161 Using the circuit symbols found in the *Reference Tables for Physical Setting/Physics*, draw a circuit showing how the lamps and battery are connected.

162 What is the potential difference supplied by the battery?

163 Calculate the equivalent resistance of the circuit. [Show all work, including the equation and substitution with units.]

164 If lamp *2* is removed from the circuit, what would be the value of the potential difference across lamp *1* after lamp *2* is removed?

165 If lamp *2* is removed from the circuit, what would be the value of the current in lamp *1* after lamp *2* is removed?

Base your answers to questions 166-168 on the information below.

You are given a 12-volt battery, ammeter A, voltmeter V, resistor R_1, and resistor R_2. Resistor R_2 has a value of 3.0 ohms.

166 Using appropriate symbols from the *Reference Tables for Physical Setting/Physics*, draw and label a complete circuit showing:

- resistors R_1 and R_2 connected in parallel with the battery
- the ammeter connected to measure the current through resistor R_1, only
- the voltmeter connected to measure the potential drop across resistor R_1