Kirchhoff's Laws 4

GCSE P P P A Level P P P

Essential Pre-Uni Physics C4.4

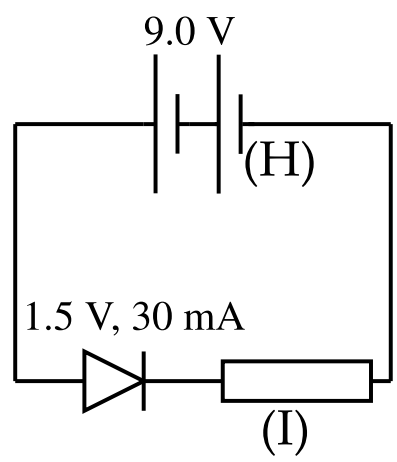

Figure 1: Circuit diagram

Part A Current in (H)

What is the current in (H)?

Part B Current in (I)

What is the current in (I)?

Part C Voltage across (I)

What is the voltage across (I)?

Kirchhoff's Laws 3

GCSE P P P A Level P P P

Essential Pre-Uni Physics C4.3

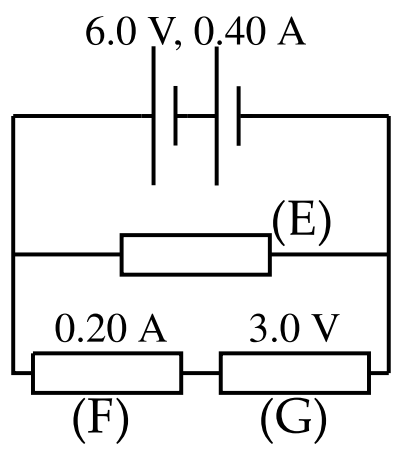

Figure 1: Circuit diagram

Part A Current in (E)

What is the current in (E)?

Part B Voltage across (E)

What is the voltage across (E)?

Part C Voltage across (F)

What is the voltage across (F)?

Part D Current in (G)

What is the current in (G)?

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Kirchhoff's Laws 5

GCSE P P P A Level P P P

Essential Pre-Uni Physics C4.5

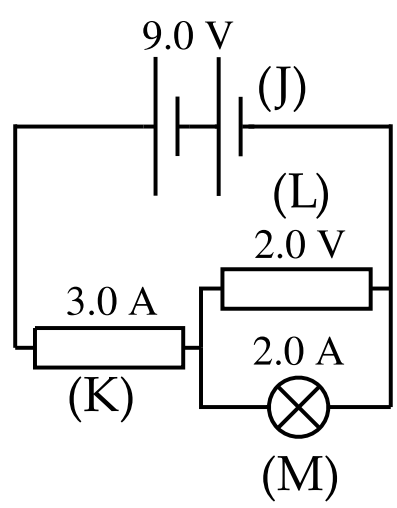

Figure 1: Circuit diagram

Part A Current in (J)

What is the current in (J)?

Part B Voltage across (K)

What is the voltage across (K)?

Part C Current in (L)

What is the current in (L)?

Part D Voltage across (M)

What is the voltage across (M)?

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Potential Dividers 1

GCSE P P P A Level P P P

Essential Pre-Uni Physics C5.1

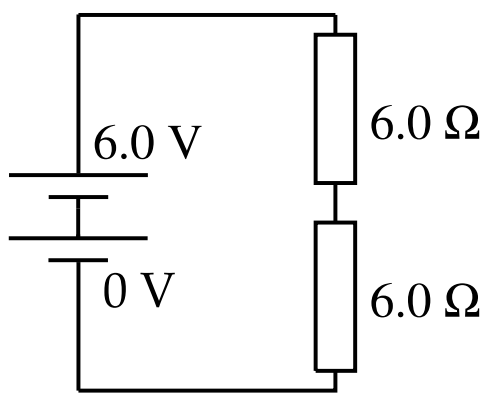

Figure 1: Circuit diagram

What is the voltage across the lower resistor in the circuit?

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Potential Dividers 4

GCSE A Level

Essential Pre-Uni Physics C5.4

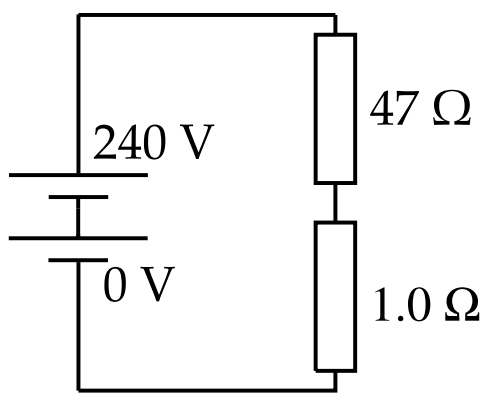

Figure 1: Circuit diagram

What is the voltage across the lower resistor in the circuit?

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Potential Dividers 6

A Level

C C C

Essential Pre-Uni Physics C5.6

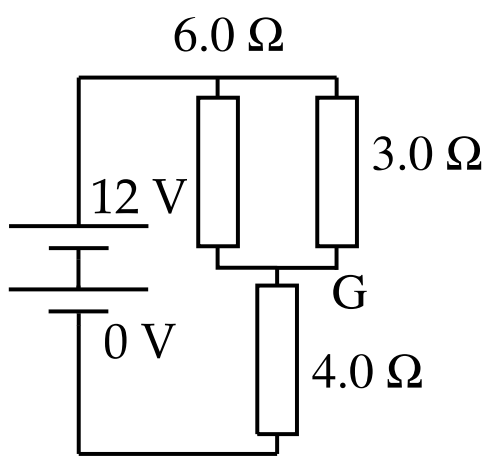

Figure 1: Circuit diagram

What is the potential at G, the junction between the two resistors in parallel and the one in series, in this circuit?

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STEM SMART Physics Week 2 - Circuits

Potential Dividers 8

GCSE C C C

A Level C C C

Essential Pre-Uni Physics C5.8

A thermistor has a resistance of $800\,\Omega$ at a temperature of $16\,^{\circ}\mathrm{C}$. It is wired in series with a fixed resistor and a $9.0\,\mathrm{V}$ battery. A high-resistance voltmeter is connected to give a 'temperature' reading.

[Note: For this thermistor the resistance decreases as the temperature increases.]

Part A Connecting the voltmeter

a) If the voltage reading is to go up when the temperature increases, should the voltmeter be connected in parallel with the thermistor or the fixed resistor?

- Fixed resistor
- Thermistor

Part B Resistance of the fixed resistor

b) If the voltmeter needs to read $3.0\,\mathrm{V}$ when the temperature is $16\,^{\circ}\mathrm{C}$, what is the resistance of the fixed resistor to 2 significant figures?

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Internal Resistance 4

A Level

C C C

Essential Pre-Uni Physics C6.4

A high-resistance voltmeter is connected in parallel with a portable battery used to start cars. Before the car is connected, the meter reads $12.4\,\mathrm{V}$. When the car is connected, and a $64\,\mathrm{A}$ current is flowing, the meter reads $11.5\,\mathrm{V}$.

Part A E.m.f. of the battery

What is the e.m.f. of the battery to 3 significant figures?

Part B Internal resistance of the battery

What is the internal resistance of the battery?

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Batteries and Resistors in Parallel

GCSE C C C

A Level P P P

In the circuit diagram shown below, $R_1 = 3.0\,\Omega$, $R_2 = 2.0\,\Omega$, $R_3 = 5.0\,\Omega$ and two ideal batteries with $V = 1.5\,\text{V}$.

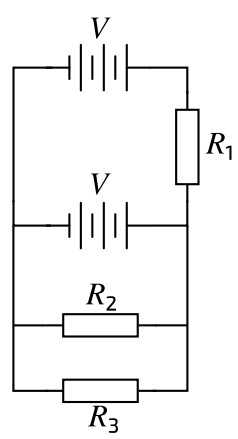

Figure 1: Circuit diagram showing two resistors and a battery in parallel, where the battery is also connected to a resistor and another battery in series.

Part A Power dissipated by a resistor

What is the power dissipated by the resistor with resistance R_1?

Part B Power dissipated by another resistor

What is the power dissipated by the resistor R_3?

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A Power Problem

GCSE C C C A Level C C C

The circuit shown in the figure below is made up of a battery connected to a set of resistors with different values of resistance. However, if a power of over $2.00\,\mathrm{W}$ is dissipated in one of these resistors, that resistor will fail.

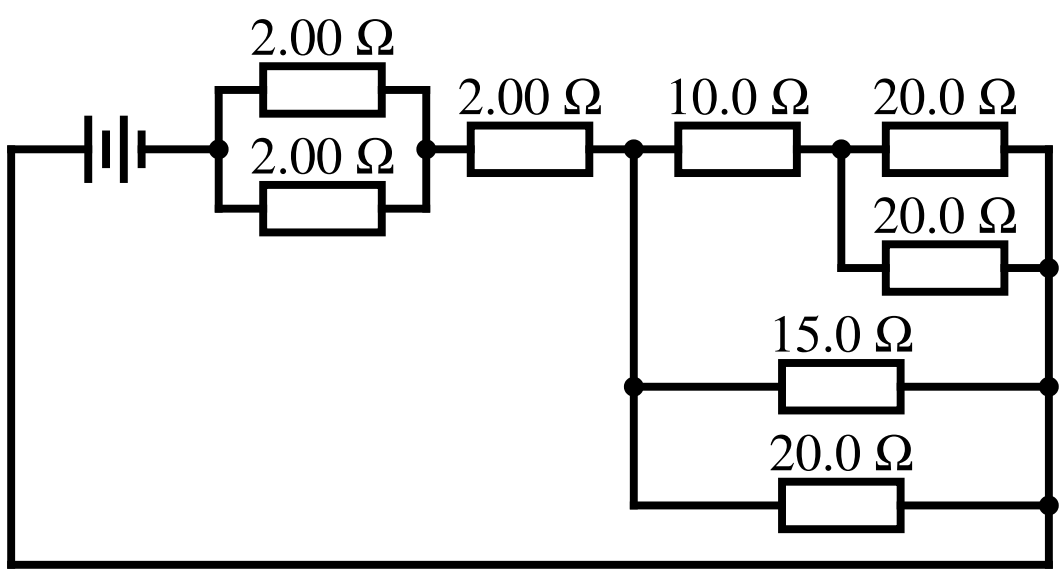

Figure 1: Circuit diagram showing a resistor network with the resistance values on the resistors.

What is the maximum voltage of the battery that can be used without any of the resistors failing?

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