Essential Pre-Uni Physics C1.3

A Level

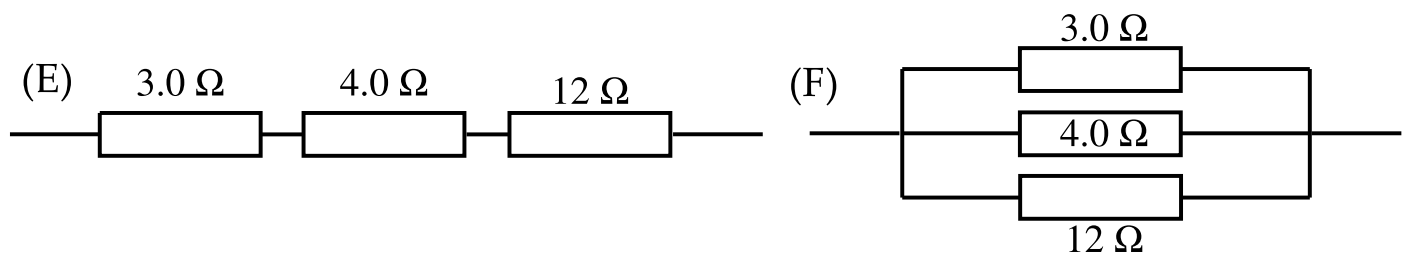

Figure 1: Two different resistor arrangements

Part A Combination (E)

What is the resistance of combination (E)? Answer to 2 significant figures.

Part B Combination (F)

What is the resistance of combination (F)? Answer to 2 significant figures.

Essential Pre-Uni Physics C1.7

A Level

Complete the questions in the table.

Length / m	**Wire thickness**	**Resistivity** / $\Omega\,\mathrm{m}$	**Resistance** / Ω
15000	$1.0\,\mathrm{cm}$ diameter	1.5×10^{-7}	R

What is the resistance R? Please provide your answer to 2 significant figures

Gameboard:

STEM SMART Physics 46 - Revision - Electricity

Essential Pre-Uni Physics C2.3

A Level

Data:

- Magnitude of the charge on the electron = $1.60 \times 10^{-19}\ \text{C}$

Alpha particles have twice the charge of an electron. What is the current caused by a radioactive source which emits 3000 alpha particles per second, to 3 significant figures?

Gameboard:

STEM SMART Physics 46 - Revision - Electricity

Essential Pre-Uni Physics C5.7

A Level

C C C

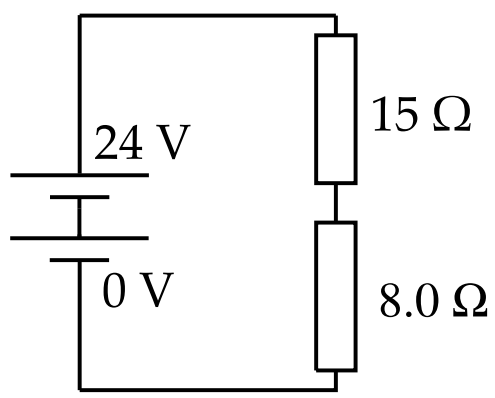

Figure 1: Circuit diagram

The $8.0\,\Omega$ resistance in this circuit is a loudspeaker (the battery represents the amplifier). The other resistor is replaced with a variable resistor which can take the values between $0\,\Omega$ and $30\,\Omega$, and is used as a volume control. This volume control changes the voltage across the speaker.

Part A Minimum voltage

a) What is the minimum possible voltage across the speaker?

Part B Maximum voltage

b) What is the maximum possible voltage across the speaker?

Gameboard:

STEM SMART Physics 46 - Revision - Electricity

Essential Pre-Uni Physics C6.4

A Level

C C C

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?

Gameboard:

STEM SMART Physics 46 - Revision - Electricity

Current Division 9.3

A Level

How much current flows through a $330\,\Omega$ resistor which is connected in parallel with a $68\,\Omega$ resistor which is carrying $40\,\mathrm{mA}$ by itself?

Gameboard:

STEM SMART Physics 46 - Revision - Electricity

Power in a Potential Divider 10.9

A Level

Calculate the voltage, current and power for each of the resistors in the circuit in **Figure 1**.

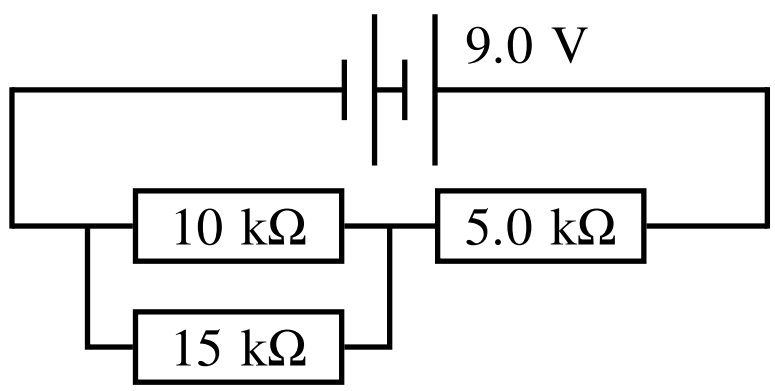

Figure 1: A circuit.

Part A $R = 10\,\mathrm{k\Omega}$

What is the voltage across the $10\,\mathrm{k\Omega}$ resistor?

What is the current through the $10\,\mathrm{k\Omega}$ resistor?

What is the power dissipated by the $10\,\mathrm{k\Omega}$ resistor?

Part B $R = 15\,\mathrm{k\Omega}$

What is the voltage across the $15\,\mathrm{k\Omega}$ resistor?

What is the current through the $15\,\mathrm{k\Omega}$ resistor?

What is the power dissipated by the $15\,\mathrm{k\Omega}$ resistor?

Part C $R = 5.0\,\mathrm{k\Omega}$

What is the voltage across the $5.0\,\mathrm{k\Omega}$ resistor?

What is the current through the $5.0\,\mathrm{k\Omega}$ resistor?

What is the power dissipated by the $5.0\,\mathrm{k\Omega}$ resistor?

Gameboard:

STEM SMART Physics 46 - Revision - Electricity

Power in a Potential Divider 10.8

A Level

A $\varepsilon = 5.4\,\mathrm{V}$ power supply (with $r = 8.0\,\Omega$) powers a $50\,\Omega$ phone. A voltmeter (with resistance $200\,\Omega$) is connected to measure V.

Part A Voltage V

How much voltage V is measured across the phone?

Part B Power delivered

Calculate the power delivered to the phone.