FREE REVISION PACK

Potential Dividers

AQA A-level Physics · 7407 / 7408 · Specification 3.5.1.5

Easy | Medium | Multiple choice · past-paper questions

5	5	≈ 10 min
QUESTIONS	TOTAL MARKS	SUGGESTED TIME*

Contents

Q	LEVEL	FOCUS	SOURCE	MARKS
1	Easy	A voltmeter that loads the circuit	AQA June 2019 · AS Paper 2 · Q32	1 mark
2	Medium	Range of a potential divider	AQA June 2023 · AS Paper 2 · Q30	1 mark
3	Medium	Balancing a resistance wire against two resistors	AQA June 2025 · AS Paper 2 · Q7	1 mark
4	Medium	Temperature-sensing circuit	AQA 2020 · AS Paper 2 · Q34	1 mark
5	Medium	Circuit for a full lamp I–V characteristic	AQA June 2023 · AS Paper 2 · Q31	1 mark

Key ideas to have ready

- In a potential divider, the pd splits in proportion to the resistances: $V_{out} = V_{in} \times R_2 / (R_1 + R_2)$.
- A meter connected across part of a circuit is in parallel with it, so it changes the resistance of that part unless it is ideal.
- With a sensor (thermistor or LDR) in a divider, the pd across the sensor rises when the sensor's resistance rises.
- Along a uniform resistance wire, the pd is proportional to length.

How to use this pack

1. The questions are grouped into levels (Easy and Medium). Work through them in order, and check your answers at the end of each level before moving on.
2. Every question is multiple choice with one correct answer. Write down your working anyway; that is how you find mistakes.
3. The separate mark scheme uses the same numbers and explains every answer.

Levels are based on how students did in AQA's examiner reports where that information exists, plus our own difficulty rating. *About 1.5 minutes per question.

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Easy

Definitions and one-step ideas. Most students get these right.

Question 1

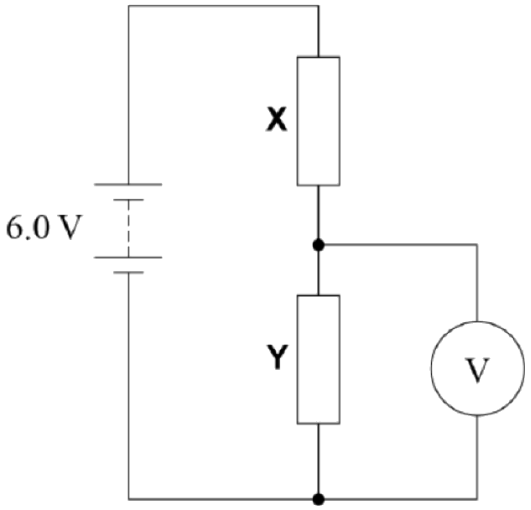
Only **one** answer per question is allowed. For each question, completely fill in the circle alongside the appropriate answer.

AQA June 2019 · AS Paper 2 · Q32

1 Resistors **X** and **Y** are connected in series with a 6.0 V battery of negligible internal resistance.

X has resistance R and **Y** has resistance $\frac{R}{2}$.

A voltmeter of resistance R is connected across **Y**.



What is the reading on the voltmeter?

A 0.0 V

B 1.5 V

C 3.0 V

D 4.5 V

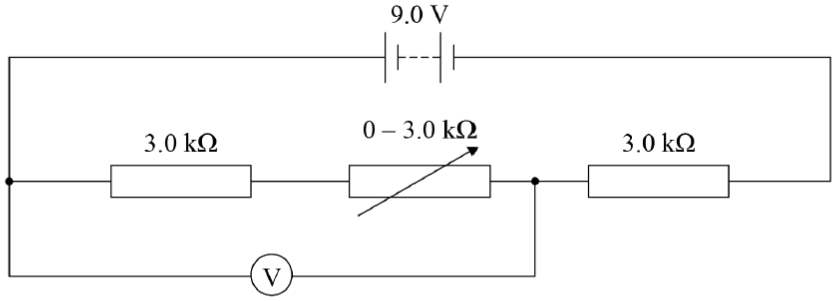
Medium

Two or three steps. Roughly a third to a half of students get these right.

Questions 2–5

AQA June 2023 · AS Paper 2 · Q30

2 Three resistors are connected in series with a 9.0 V battery of negligible internal resistance.



The resistance of the variable resistor is varied from 0 to 3.0 kΩ.

The range of potential difference observed on the voltmeter is

[1 mark]

A 0 to 6.0 V ⬭

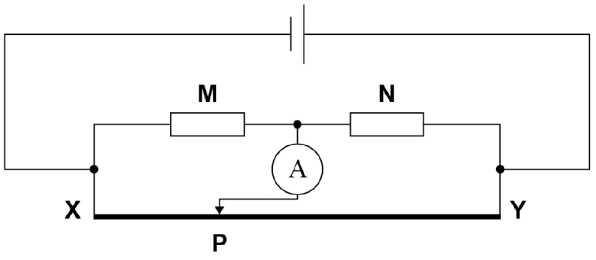
B 3.0 V to 6.0 V ⬭

C 4.5 V to 6.0 V ⬭

D 4.5 V to 9.0 V ⬭

AQA June 2025 · AS Paper 2 · Q7

3 A long uniform metal wire **XY** is connected in parallel to two resistors **M** and **N** as shown.



An ammeter connects the wire between **M** and **N** to a point **P** on **XY**.
The reading on the ammeter is zero.

A change is then made to the circuit. After the change, the ammeter connection on **XY** has to be moved from **P** towards **X** so that the ammeter again reads zero.

What change was made to the circuit?

[1 mark]

A **N** was replaced with a resistor of greater resistance. ⬭

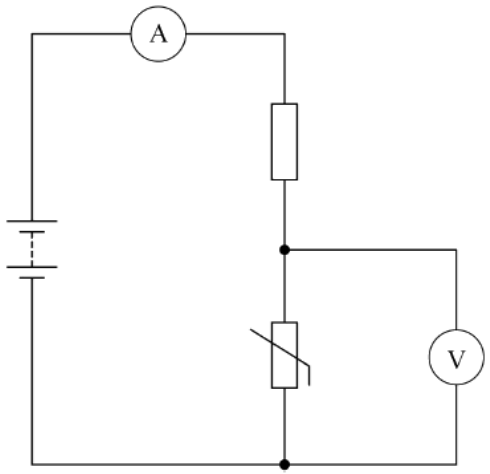
B **XY** was replaced with a wire of greater resistance. ⬭

C The cell was replaced with one of greater emf. ⬭

D The cell was replaced with one of greater internal resistance. ⬭

AQA 2020 · AS Paper 2 · Q34

4 The diagram shows a temperature-sensing circuit.



The temperature of the thermistor is decreased.

Which row shows the changes to the ammeter reading and the voltmeter reading?

[1 mark]

	Ammeter reading	Voltmeter reading	
A	increases	increases	⬭
B	increases	decreases	⬭
C	decreases	decreases	⬭
D	decreases	increases	⬭

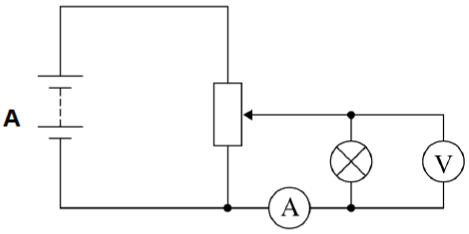
AQA June 2023 · AS Paper 2 · Q31

5 The current–voltage characteristic between 0 and $6.0\ \text{V}$ is required for a filament lamp. The lamp is connected in a circuit with a battery of emf $6.0\ \text{V}$ and negligible internal resistance.

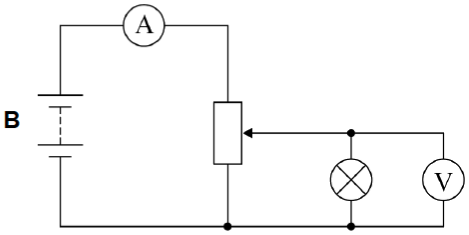
Which circuit should be used?

[1 mark]

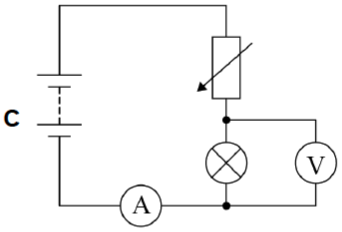
A



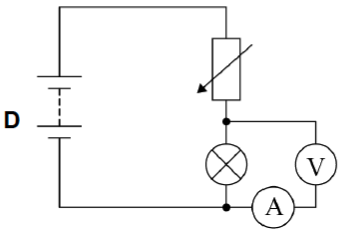
B



C



D



End of questions. Check your answers with the matching mark scheme. More free packs and 1-to-1 tuition:
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