FREE REVISION PACK

Electric Fields & Coulomb's Law

AQA A-level Physics · 7408 · Specification 3.7.3.1–3.7.3.2

Easy | Medium | Multiple choice · past-paper questions

6	6	≈ 10 min
QUESTIONS	TOTAL MARKS	SUGGESTED TIME*

Contents

Q	LEVEL	FOCUS	SOURCE	MARKS
1	Easy	Force after adding charge to both	AQA November 2020 · A-level Paper 2 · Q14	1 mark
2	Easy	Field lines for two unequal opposite charges	AQA June 2025 · A-level Paper 2 · Q11	1 mark
3	Easy	Changing the charges and the separation	AQA November 2021 · A-level Paper 2 · Q14	1 mark
4	Medium	Field lines for a charged sphere inside another	AQA June 2018 · A-level Paper 2 · Q20	1 mark
5	Medium	Inverse-square force over a larger distance	AQA June 2023 · A-level Paper 2 · Q15	1 mark
6	Medium	Where the field between unequal charges is zero	AQA June 2025 · A-level Paper 2 · Q15	1 mark

Key ideas to have ready

- Coulomb's law: $F = Q_1Q_2 / (4\pi\varepsilon_0 r^2)$. Like charges repel; unlike charges attract.
- Electric field strength $E = F / Q$. For a point charge, $E = Q / (4\pi\varepsilon_0 r^2)$, directed away from a positive charge.
- Field lines start on positive charge and end on negative charge; more charge means more lines. Inside a conductor the field is zero.
- Two opposite charges of unequal size: the field is zero at a point outside the pair, beyond the smaller charge.

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.

Questions 1–3

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

AQA November 2020 · A-level Paper 2 · Q14

1 Two fixed charges of magnitude $+Q$ and $+3Q$ repel each other with a force F.
An additional charge of $-2Q$ is given to each charge.

What are the magnitude and the direction of the force between the charges?

[1 mark]

	Magnitude of force	Direction of force	
A	$\frac{F}{3}$	repulsive	⬭
B	$5F$	attractive	⬭
C	$5F$	repulsive	⬭
D	$\frac{F}{3}$	attractive	⬭

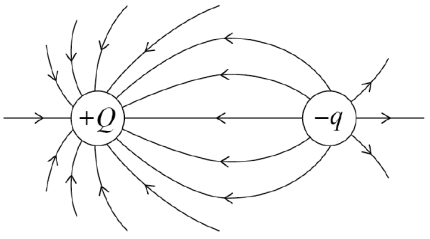
AQA June 2025 · A-level Paper 2 · Q11

2 Two charged metal spheres have charges $+Q$ and $-q$.
The magnitude of $+Q$ is greater than the magnitude of $-q$.

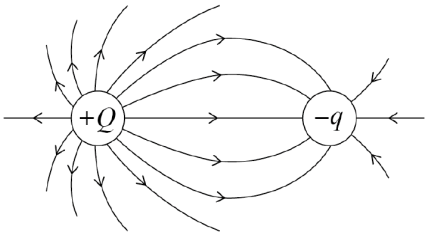
In which diagram are the electric field lines correct?

[1 mark]

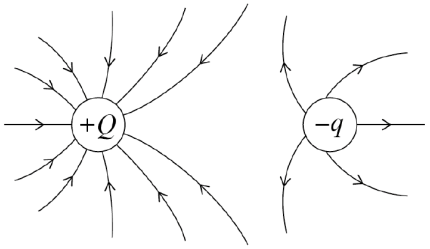
A



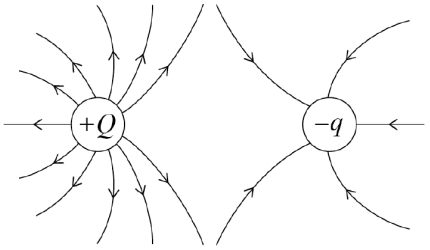
B



C

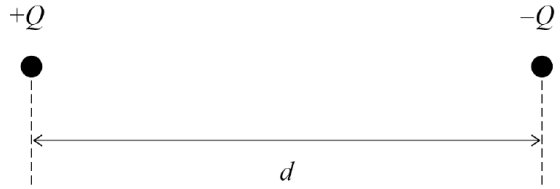


D



AQA November 2021 · A-level Paper 2 · Q14

3 The diagram shows a particle with charge $+Q$ and a particle with charge $-Q$ separated by a distance d.
The particles exert a force F on each other.



An additional charge of $+2Q$ is then given to each particle and their separation is increased to $2d$.

What is the force that now acts between the particles?

[1 mark]

A an attractive force of $\frac{9}{2}F$ ⬭

B an attractive force of $\frac{9}{4}F$ ⬭

C a repulsive force of $\frac{3}{2}F$ ⬭

D a repulsive force of $\frac{3}{4}F$ ⬭

Medium

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

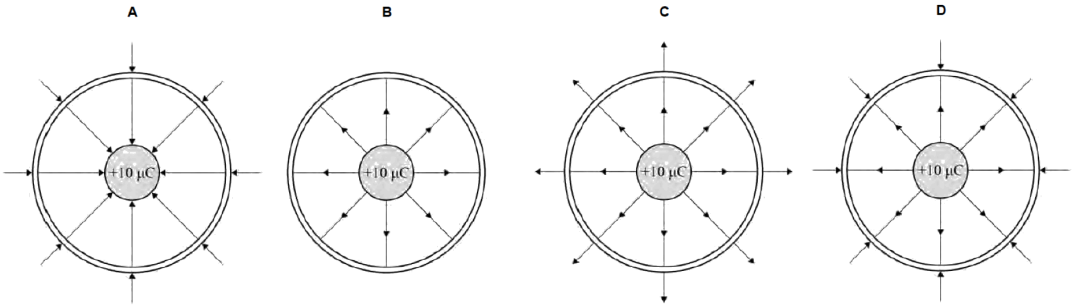
Questions 4–6

AQA June 2018 · A-level Paper 2 · Q20

4 A conducting sphere holding a charge of $+10\ \mu C$ is placed centrally inside a second uncharged conducting sphere.

Which diagram shows the electric field lines for the system?

[1 mark]



AQA June 2023 · A-level Paper 2 · Q15

5 Two point charges are separated by a distance of $200\ mm$.
The force of attraction between them is $180\ \mu N$.
The distance between the point charges is increased by $400\ mm$.

What is the new force of attraction?

[1 mark]

A $20\ \mu N$ ⬭

B $45\ \mu N$ ⬭

C $60\ \mu N$ ⬭

D $90\ \mu N$ ⬭

AQA June 2025 · A-level Paper 2 · Q15

6 The diagram shows point charges **Q** and **q**.

Q and **q** have charges of opposite sign.

The magnitude of the charge of **Q** is greater than the magnitude of the charge of **q**.



The electric field strength is zero at one of the points **A**, **B**, **C** or **D**.

At which point is the electric field strength zero?

[1 mark]

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