FREE REVISION PACK

Gravitational Fields

Pearson Edexcel International Advanced Level Physics · Unit 5 (WPH15) · Specification points 154–157

Easy | Medium | Multiple choice · past-paper questions

5	5	≈ 10 min
QUESTIONS	TOTAL MARKS	SUGGESTED TIME*

Contents

Q	LEVEL	FOCUS	SOURCE	MARKS
1	Easy	Force and potential energy as the Moon moves away	Edexcel IAL January 2025 · Unit 5 · Q9	1 mark
2	Easy	Comparing g on Earth and Mars	Edexcel IAL January 2024 · Unit 5 · Q10	1 mark
3	Easy	Weight of a satellite in orbit	Edexcel IAL January 2021 · Unit 5 · Q7	1 mark
4	Easy	Weight of a satellite at a height of one Earth radius	Edexcel IAL October 2023 · Unit 5 · Q7	1 mark
5	Medium	g on a planet of the same density but twice the radius	Edexcel IAL June 2022 · Unit 5 · Q6	1 mark

Key ideas to have ready

- $F = GMm/r^2$; $g = GM/r^2$ (r measured from the centre).
- At twice the distance from the centre, g (and weight) is a quarter.
- An orbiting satellite still has weight: gravity provides the centripetal force.
- For a planet of density ρ, $g = (4/3)\pi G\rho r$.

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 Pearson's examiner reports where that information exists, plus our own difficulty rating. *About 1.5 minutes per question.

Questions are reproduced from Pearson Edexcel International Advanced Level past papers; Pearson Edexcel material is © Pearson Education Ltd. Question numbers have been changed to suit this pack. Get Better At Physics is an independent tutor and is not affiliated with or endorsed by Pearson. Free for personal revision and classroom use.

Easy

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

Questions 1–4

Choose **one** answer for each question and put a cross in the box next to it.

Edexcel IAL January 2025 · Unit 5 · Q9

1 Due to tidal action, the Moon is slowly moving away from the Earth.

As the Moon moves away from the Earth, the gravitational force between the Earth and the Moon changes. The gravitational potential energy of the Moon also changes.

Which row of the table correctly shows these changes?

	Gravitational force between the Earth and the Moon	Gravitational potential energy of the Moon
☒ **A**	decreases	decreases
☒ **B**	decreases	increases
☒ **C**	increases	decreases
☒ **D**	increases	increases

Edexcel IAL January 2024 · Unit 5 · Q10

2 The Earth has 10 times the mass of Mars and twice the radius of Mars.

The gravitational field strength at the surface of the Earth is g_E.
The gravitational field strength at the surface of Mars is g_M.

Which of the following gives the relationship between g_E and g_M?

☒ **A** $g_E = 2.5 g_M$

☒ **B** $g_E = 5 g_M$

☒ **C** $g_M = 2.5 g_E$

☒ **D** $g_M = 5 g_E$

Edexcel IAL January 2021 · Unit 5 · Q7

3 A small satellite of mass 245 kg is orbiting the Earth. The radius of the orbit is equal to twice the radius of the Earth.

The weight of the satellite in its orbit is about

☒ **A** zero.

☒ **B** 600 N.

☒ **C** 1200 N.

☒ **D** 2400 N.

Edexcel IAL October 2023 · Unit 5 · Q7

4 A small satellite of mass 122 kg is orbiting the Earth. The satellite is orbiting at a height above the surface of the Earth equal to the radius of the Earth.

Which of the following is the approximate weight of the satellite in its orbit?

☒ **A** zero

☒ **B** 300 N

☒ **C** 600 N

☒ **D** 1200 N

Medium Two or three steps. Roughly a third to a half of students get these right. **Question 5**

Edexcel IAL June 2022 · Unit 5 · Q6

5 The gravitational field strength at the surface of the Earth is g.

Another planet has the same density as the Earth, but twice the radius of the Earth.

What is the gravitational field strength at the surface of this planet?

☐ **A** $4g$

☐ **B** $2g$

☐ **C** $\frac{g}{2}$

☐ **D** $\frac{g}{4}$

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