FREE REVISION PACK

Springs & Pendulums

Pearson Edexcel International Advanced Level Physics · Unit 5 (WPH15) · Specification points 145, 149

Easy | Multiple choice · past-paper questions

5	5	≈ 10 min
QUESTIONS	TOTAL MARKS	SUGGESTED TIME*

Contents

Q	LEVEL	FOCUS	SOURCE	MARKS
1	Easy	Doubling the length of a pendulum	Edexcel IAL October 2023 · Unit 5 · Q10	1 mark
2	Easy	a–x graph for a simple pendulum	Edexcel IAL October 2024 · Unit 5 · Q4	1 mark
3	Easy	Doubling the mass on a spring	Edexcel IAL October 2024 · Unit 5 · Q6	1 mark
4	Easy	Ratio of periods for two masses on a spring	Edexcel IAL October 2025 · Unit 5 · Q9	1 mark
5	Easy	Length of a long pendulum	Edexcel IAL January 2022 · Unit 5 · Q3	1 mark

Key ideas to have ready

- Mass–spring: $T = 2\pi\sqrt{(m/k)}$. Simple pendulum: $T = 2\pi\sqrt{(l/g)}$.
- $f = 1/T$, so $f \propto 1/\sqrt{m}$ (spring) and $f \propto 1/\sqrt{l}$ (pendulum).
- One extreme to the other is half a period.
- A pendulum's period does not depend on its mass or (small) amplitude.

How to use this pack

1. The questions are grouped into levels (Easy). 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.

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Easy

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

Questions 1–5

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

Edexcel IAL October 2023 · Unit 5 · Q10

1 A simple pendulum is displaced through a small angle then released. The frequency of oscillation is determined.
The length of the pendulum is then doubled.

By what factor will the frequency of oscillation be multiplied?

☒ **A** $\frac{1}{\sqrt{2}}$

☒ **B** $\frac{1}{2}$

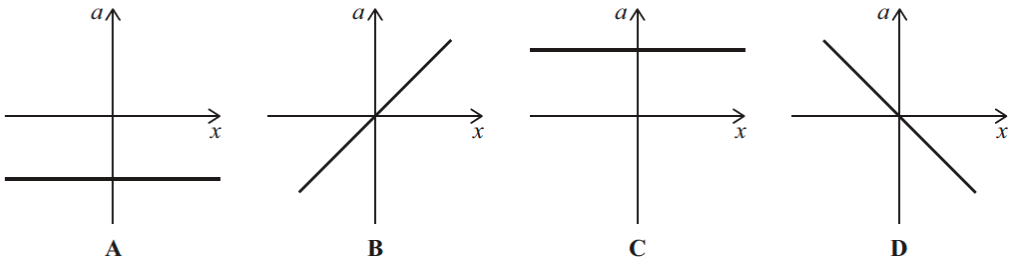
☒ **C** $\sqrt{2}$

☒ **D** 2

Edexcel IAL October 2024 · Unit 5 · Q4

2 A simple pendulum consists of a mass attached to a string. The pendulum is set into simple harmonic motion.
The acceleration of the mass is a and the displacement of the mass is x.

Which of the following graphs shows how a varies with x?



Edexcel IAL October 2024 · Unit 5 · Q6

3 A mass is hung on a spring. The mass is set into vertical oscillation with frequency of oscillation f.

The mass on the spring is doubled.

What is the new frequency of oscillation?

☒ **A** $\frac{f}{2}$

☒ **B** $\frac{f}{\sqrt{2}}$

☒ **C** $\sqrt{2}f$

☒ **D** $2f$

Edexcel IAL October 2025 · Unit 5 · Q9

4 A 500 g mass was hung from a spring. The mass was displaced vertically downwards by a small distance and released. The mass oscillated with simple harmonic motion of period T_1.

The 500 g mass was replaced by a 250 g mass and the spring set into oscillation. The 250 g mass oscillated with a period T_2.

Which of the following is the ratio $\frac{T_1}{T_2}$?

☒ **A** $\frac{1}{\sqrt{2}}$

☒ **B** $\frac{1}{2}$

☒ **C** $\sqrt{2}$

☒ **D** 2

Edexcel IAL January 2022 · Unit 5 · Q3

5 In the Pantheon in Paris there is a pendulum that takes 8.25 s to swing from one extreme position to the other.

Which of the following expressions gives the length of the pendulum?

☒ **A** $\frac{4\pi^2}{(8.25)^2 \times 9.81}$

☒ **B** $\frac{4\pi^2}{(16.5)^2 \times 9.81}$

☒ **C** $\frac{(8.25)^2 \times 9.81}{4\pi^2}$

☒ **D** $\frac{(16.5)^2 \times 9.81}{4\pi^2}$

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