FREE REVISION PACK

# Equilibrium & Free-Body Diagrams

Pearson Edexcel International Advanced Level Physics · Unit 1 (WPH11) · Specification points 6, 8

Easy | Multiple choice · past-paper questions

| 5 | 5 | ≈ 10 min |
|---|---|---|
| QUESTIONS | TOTAL MARKS | SUGGESTED TIME* |

## Contents


| Q | LEVEL | FOCUS | SOURCE | MARKS |
|---|---|---|---|---|
| 1 | Easy | Forces on a hanging picture | Edexcel IAL June 2025 · Unit 1 · Q5 | 1 mark |
| 2 | Easy | Box sliding at constant speed | Edexcel IAL June 2025 · Unit 1 · Q8 | 1 mark |
| 3 | Easy | Equilibrium of a plank on two supports | Edexcel IAL October 2025 · Unit 1 · Q6 | 1 mark |
| 4 | Easy | Tension in a wire holding a weight | Edexcel IAL January 2025 · Unit 1 · Q10 | 1 mark |
| 5 | Easy | Tension in a string holding a bird | Edexcel IAL January 2024 · Unit 1 · Q6 | 1 mark |


**Key ideas to have ready**

- In equilibrium the resultant force is zero: the vector sum of all forces is zero (they form a closed triangle).
- Resolve forces vertically and horizontally (or along and perpendicular to a slope) and make each component balance.
- On a slope of angle θ: weight component down the slope = W sin θ; perpendicular to it = W cos θ.
- A free-body diagram shows only forces acting *on* the object, each drawn from where it acts.

**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.

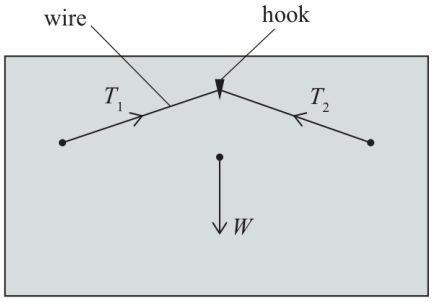
Questions 1–5

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

Edexcel IAL June 2025 · Unit 1 · Q5

**1** A wire is used to hang a picture from a hook on a wall.

The wire exerts forces $T_1$ and $T_2$ on the picture. The picture has weight $W$, as shown.



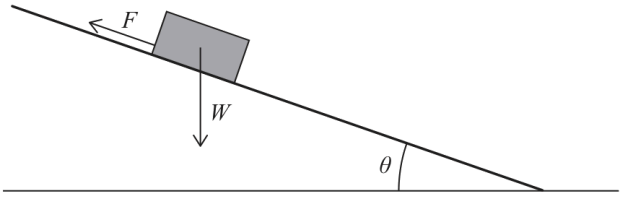

Not to scale

Which of the following describes the relationship between the forces when the picture is hanging on the wall?

- ☒ **A** $\vec{W} = \vec{T_1} + \vec{T_2}$
- ☒ **B** $\vec{W} + \vec{T_1} + \vec{T_2} = 0$
- ☒ **C** $\vec{W} = \vec{T_1} - \vec{T_2}$
- ☒ **D** $\vec{W} + \vec{T_1} - \vec{T_2} = 0$

Edexcel IAL June 2025 · Unit 1 · Q8

**2** A box of weight $W$ slides down a ramp. The ramp is at an angle $\theta$ to the horizontal. A frictional force $F$ acts on the box, as shown.

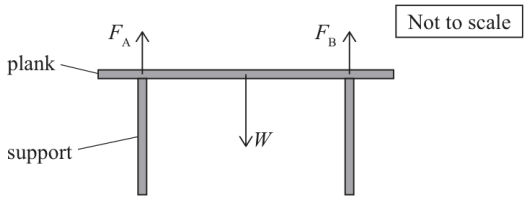



Which of the following is correct when the box moves at a constant speed?

- ☒ **A** $F = W\cos\theta$
- ☒ **B** $F < W\cos\theta$
- ☒ **C** $F = W\sin\theta$
- ☒ **D** $F < W\sin\theta$

Edexcel IAL October 2025 · Unit 1 · Q6

**3** A plank of wood has weight $W$. The plank rests on two supports. The forces from the supports on the plank are $F_A$ and $F_B$, as shown.




Which of the following vector equations gives the relationship between $F_A$, $F_B$ and $W$?

☒ **A** $\overrightarrow{F_A} - \overrightarrow{F_B} = \overrightarrow{W}$

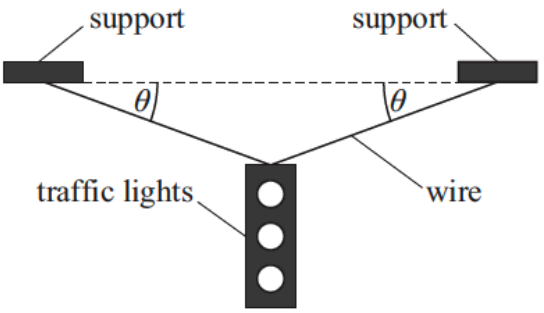
☒ **B** $\overrightarrow{F_A} = \overrightarrow{F_B} - \overrightarrow{W}$

☒ **C** $\overrightarrow{F_A} + \overrightarrow{F_B} - \overrightarrow{W} = 0$

☒ **D** $\overrightarrow{F_A} + \overrightarrow{F_B} + \overrightarrow{W} = 0$

Edexcel IAL January 2025 · Unit 1 · Q10

**4** Traffic lights of weight $W$ are suspended from a wire.
The wire is held at an angle $\theta$ to the horizontal by two supports, as shown.




Which of the following expressions gives the tension in the wire?

☒ **A** $2W \sin\theta$

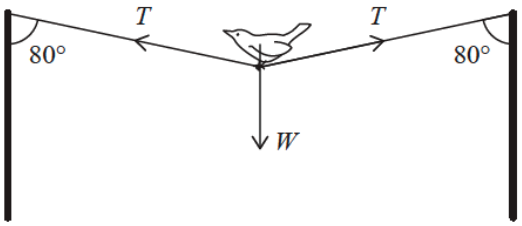
☒ **B** $\dfrac{W}{2\sin\theta}$

☒ **C** $2W \cos\theta$

☒ **D** $\dfrac{W}{2\cos\theta}$

Edexcel IAL January 2024 · Unit 1 · Q6

**5** A length of string is attached between two vertical posts. A bird of weight $W$ stands on the middle of the string causing tension $T$ in the string. The string makes an angle of 80° with each post, as shown.




Which of the following expressions is correct?

☒ **A** $T = \dfrac{W}{2\sin 80°}$

☒ **B** $T = W \times 2\sin 80°$

☒ **C** $T = \dfrac{W}{2\cos 80°}$

☒ **D** $T = W \times 2\cos 80°$

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