BTECRevision

LEARN → QUIZ → WORKBOOK → EXAM PRACTICE

PHYSICS

FREE SAMPLE

UNIT 3 · TOPIC PRACTICE WORKBOOK

A1.4 — Calculating wave speed, frequency and wavelength

A complete sample section: 6 written questions, answer spaces and worked solutions. The full workbook contains 56 sections.

Try the questions before reading the included solutions.

Extract pages retain their original page numbers.

Independent original practice. Not an official Pearson assessment.

Aligned to Pearson AAQ Applied Science, specification Issue 7 (May 2026).

UNIT 3 / A1.4 / SECTION 08

Calculating wave speed, frequency and wavelength

Learning goals: Apply the wave equation; rearrange it with consistent units.

Open corresponding online lesson | Planned URL - publication unverified

Topic marks: 18 My score: _____ Retry date: _____

Q1 Build **2 marks**

State the wave equation and SI units for frequency and wavelength.

Q2 Build **3 marks**

A wave has f=75 Hz and wavelength 0.48 m. Calculate speed.

UNIT 3 / A1.4 / SECTION 08

Calculating wave speed, frequency and wavelength

Open corresponding online lesson | Planned URL - publication unverified
Continue independently; use extra paper if needed.

Q3 Apply **3 marks**

Sound travels at 336 m/s with frequency 560 Hz. Calculate wavelength.

Q4 Apply **3 marks**

A ripple travels at 0.42 m/s and has wavelength 14 mm. Calculate frequency.

UNIT 3 / A1.4 / SECTION 08

Calculating wave speed, frequency and wavelength

Open corresponding online lesson | Planned URL - publication unverified
Continue independently; use extra paper if needed.

Q5 Reason **3 marks**

Draw a graph of frequency against wavelength for fixed positive wave speed. State the relationship.

Q6 Reason **4 marks**

A measured wavelength is too large by 5%, while frequency is correct. Explain the effect on calculated speed and propose an improvement.

Next: A 1.5 - Stationary waves, resonance and instruments

UNIT 3 / A1.4 / SECTION 08

Calculating wave speed, frequency and wavelength

Q1 [2 marks] State the wave equation and SI units for frequency and wavelength.

v=f λ [1];
hertz and metres [1].

Q2 [3 marks] A wave has f=75 Hz and wavelength 0.48 m. Calculate speed.

v=f λ [1];
75 × 0.48 [1];
36 m/s [1].

Q3 [3 marks] Sound travels at 336 m/s with frequency 560 Hz. Calculate wavelength.

λ=v/f [1];
336/560 [1];
0.60 m [1].

Q4 [3 marks] A ripple travels at 0.42 m/s and has wavelength 14 mm. Calculate frequency.

14 mm=0.014 m [1];
f=0.42/0.014 [1];
30 Hz [1].

Q5 [3 marks] Draw a graph of frequency against wavelength for fixed positive wave speed. State the relationship.

Axes correctly labelled [1];
decreasing inverse curve [1];
f proportional to 1/λ [1].

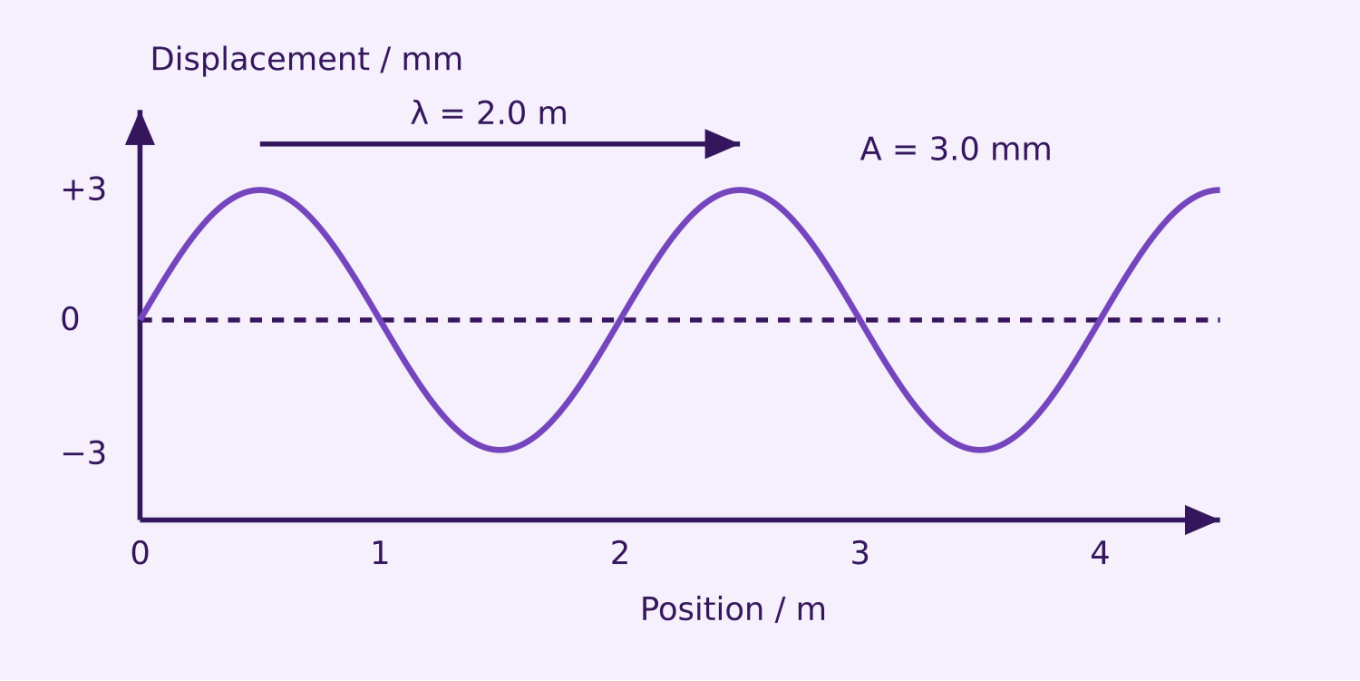
Q6 [4 marks] A measured wavelength is too large by 5%, while frequency is correct. Explain the effect on calculated speed and propose an improvement.

v product of f and λ [1];
speed too large by 5% [1];
measure several wavelengths and divide [1];
reduces relative length-reading uncertainty [1].

Common error to avoid: reading a wavelength from a time axis or using angles from the surface. Accept equivalent scientific wording and alternative valid calculations; award only the stated total. For extended answers, each distinct credited point must answer the context.

UNIT 3 / A1.4 / SECTION 08

Calculating wave speed, frequency and wavelength



Recovered lesson reference diagram. It illustrates the structure or method; use the question data for numerical answers.