

GCSE Physics B (Twenty First Century Science)
J259/02 Depth in physics (Foundation Tier)

Question Set 1

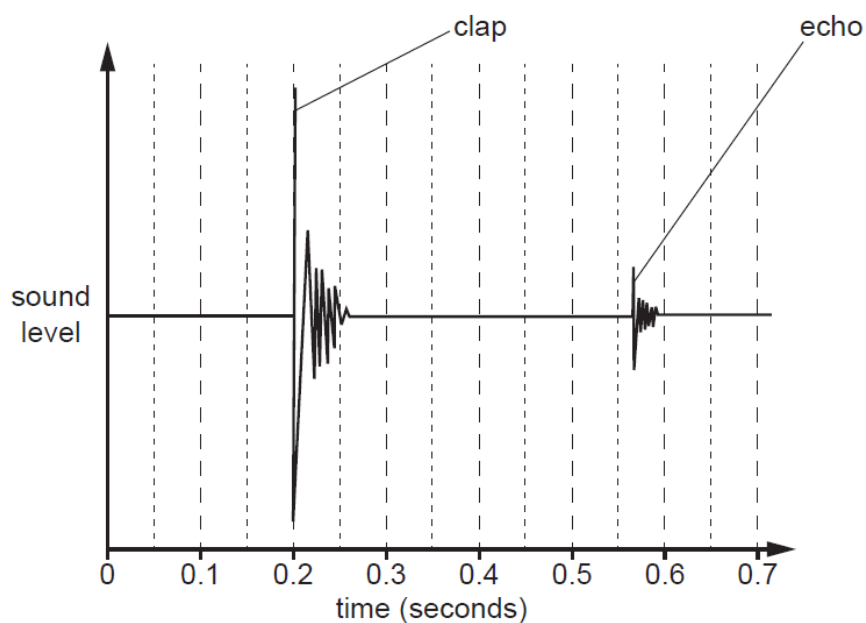
1 Over 300 years ago, Isaac Newton measured the speed of sound in air in a long outdoor corridor.

Eve and Ali repeated this experiment by measuring the time between a clap and its echo.



(a) Eve clapped her hands, and Ali timed with a tablet computer.

The computer recorded the sound of the clap and its echo and produced the graph below.



(i) What time was the sound of the **clap** recorded?

Time = seconds [1]

(ii) What time was the sound of the **echo** recorded?

Time = seconds [1]

(iii) Calculate the time of travel for the sound wave to go from Eve to the wall and to return to the computer.

Time of travel = seconds [1]

(b) The distance from Eve to the reflecting wall is 64 m.

Explain how you can use the distance, together with a time from part (a), to calculate the speed of sound.

You do not have to include the calculation. [2]

(c) Isaac Newton's value for the speed of sound was less accurate than the one given by this method.

Suggest and explain why Newton could not get an accurate answer. [2]

Total Marks for Question Set 1: 7

OCR

Oxford Cambridge and RSA

Copyright Information

OCR is committed to seeking permission to reproduce all third-party content that it uses in its assessment materials. OCR has attempted to identify and contact all copyright holders whose work is used in this paper. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download from our public website (www.ocr.org.uk) after the live examination series.

If OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, OCR will be happy to correct its mistake at the earliest possible opportunity.

For queries or further information please contact The OCR Copyright Team, The Triangle Building, Shaftesbury Road, Cambridge CB2 8EA.

OCR is part of the Cambridge Assessment Group; Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge