

A level Physics B

H557/01 Fundamentals of physics

Question Set 9

1.

An asteroid is tracked from the Earth by radar pulses.
A pulse places it at a distance of 44.444 light-minutes from Earth.
After 24 hours a second pulse places it 44.204 light-minutes from Earth.

(a) Use this data to calculate the average velocity of approach of the asteroid relative to Earth.

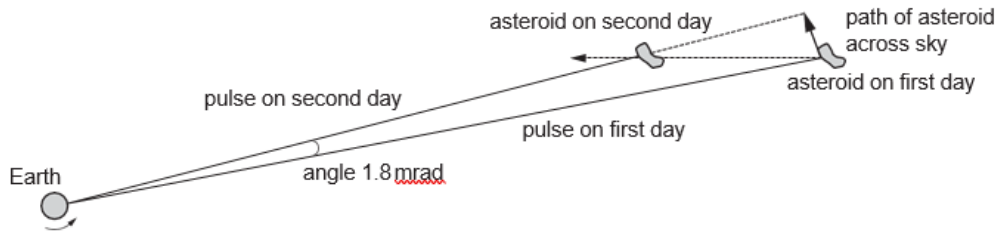
relative velocity = ms^{-1}

[2]

(b)

The path of the asteroid is shown in the figure.

After 24 hours the angular shift in position of the asteroid relative to Earth is 1.8 mrad.



(not to scale)

Estimate the velocity component of the asteroid perpendicular to its direction from Earth. Make your method clear.

perpendicular velocity = ms^{-1}

[3]

Total Marks for Question Set: 5

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