



QUESTION WORKBOOK

Stationary waves

Waves · Year 12

AQA 3.3.1.3 · CIE 8.1 · OCR A 4.4.4

10 questions · 29 marks

NAVY SCREEN EDITION

SECTION A · Warm-up

A1 Describe how a stationary wave is formed on a string. [2]

A2 State the distance between two adjacent nodes on a stationary wave, in terms of the wavelength λ . [2]

A3 Distinguish between a node and an antinode. [2]

SECTION B · Standard

B1 A string of length 0.60 m is fixed at both ends and vibrates in its fundamental mode. The wave speed on the string is 240 m s^{-1} . Calculate (a) the wavelength and (b) the fundamental frequency. [3]

- B2** For the same string and wave speed, calculate the frequencies of the second and third harmonics. [3]

- B3** A string of length 0.80 m fixed at both ends vibrates at its fundamental frequency of 150 Hz. Calculate the speed of the waves on the string. [3]

- B4** A stationary wave has a wavelength of 0.50 m. Calculate the distance between adjacent nodes, and the distance between a node and the next antinode. [3]

SECTION C · Stretch

- C1** A string of length 1.2 m fixed at both ends carries waves travelling at 180 m s^{-1} . Calculate the fundamental frequency and the frequencies of the first three harmonics. [4]

- C2** A string of length 1.0 m fixed at both ends vibrates at 300 Hz, and the wave speed on it is 200 m s^{-1} . Determine which harmonic this is. [4]

- C3** State two differences between a progressive wave and a stationary wave. [3]