3 Fig 3.1 shows a displacement-distance graph for two sound waves, A and B, of the same frequency and amplitude at a particular instant. Wave A is travelling to the right and wave B is travelling to the left.

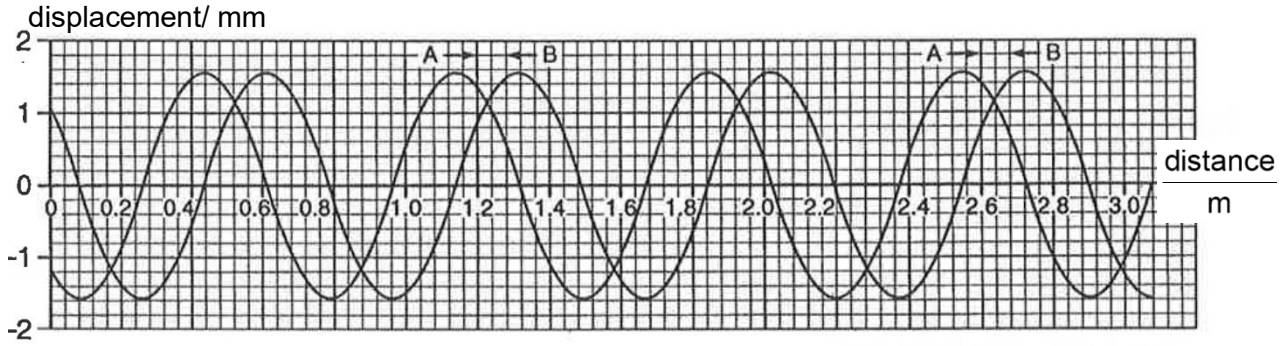

Fig. 3.1

(a) (i) Using Fig. 3.1, determine the wavelength of the two waves.

wavelength = ...m [2]

(ii) The frequency of the sound is determined to be 469 Hz. Calculate the speed of sound to 4 significant figures.

speed = ...m s^{-1} [1]

(iii) The frequency and the wavelength of the sound were determined to a precision of ± 5% and ± 8% respectively. Write down the calculated value for the speed of sound in the form ($x \pm \Delta x$).

speed = (..... ± .....) m s^{-1} [2]

(b) **(i)** State the phase difference between the two waves at the point where distance = 1.40 m in the instant shown in Fig. 3.1. Explain your answer.

.....

.....

.....[2]

(ii) Hence, calculate the maximum displacement of the resultant wave in the instant shown in Fig. 3.1. Explain your working clearly.

maximum displacement = ...mm [2]

(iii) The maximum displacement of the resultant wave increases to a maximum value some time t later. Calculate the value of t.

t = ... ms [2]

(iv) Deduce the maximum value of the maximum displacement in **(iii)**.

maximum displacement = ...mm [1]

[Total: 12]