

- 3 Two progressive water waves X and Y travel along a straight line from point A to point B. The variation of displacement of the waves with distance from A at an instant in time is shown in Fig. 3.1.

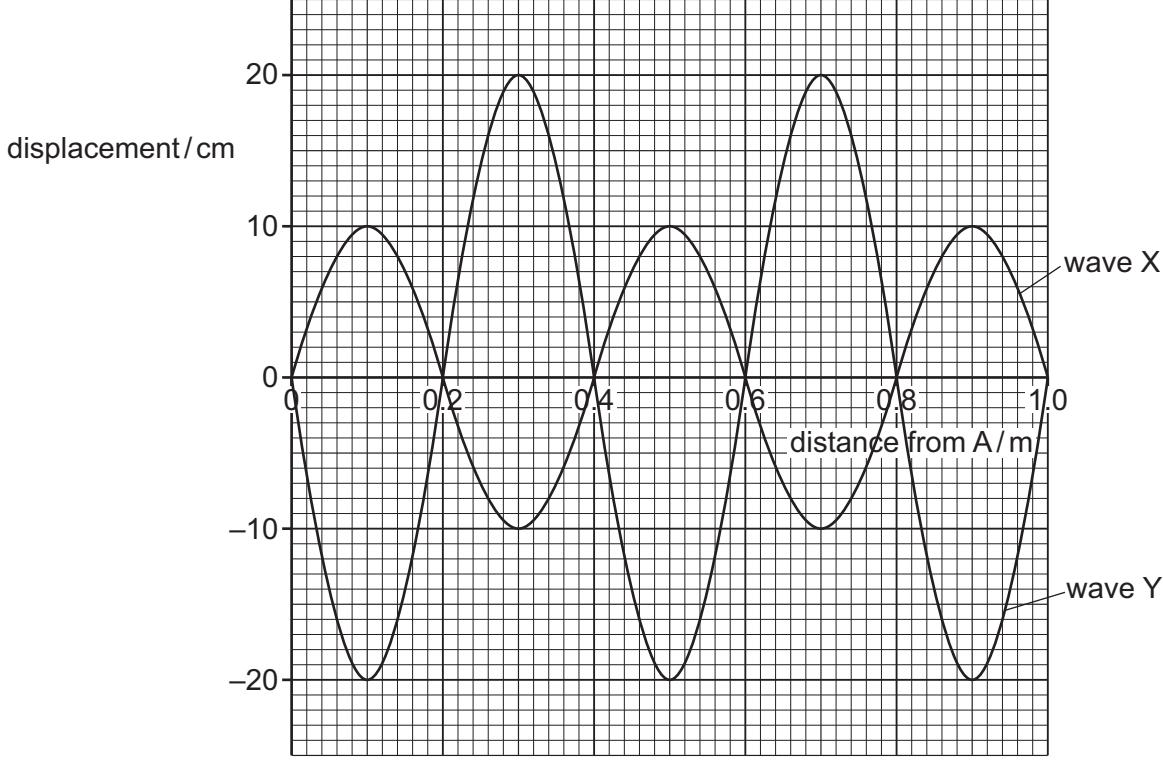


Fig. 3.1

- (a) State the amplitude of wave X.

amplitude = cm [1]

- (b) Both waves have frequency 16 Hz.

- (i) Determine the speed of wave X.

speed = ms^{-1} [2]

- (ii) State and explain whether X and Y are coherent.

.....
.....
..... [1]



- (c) Wave X and wave Y superpose to form a resultant wave.

On Fig. 3.2, sketch the variation of displacement of the resultant wave with distance from A at the instant of time shown in Fig. 3.1.

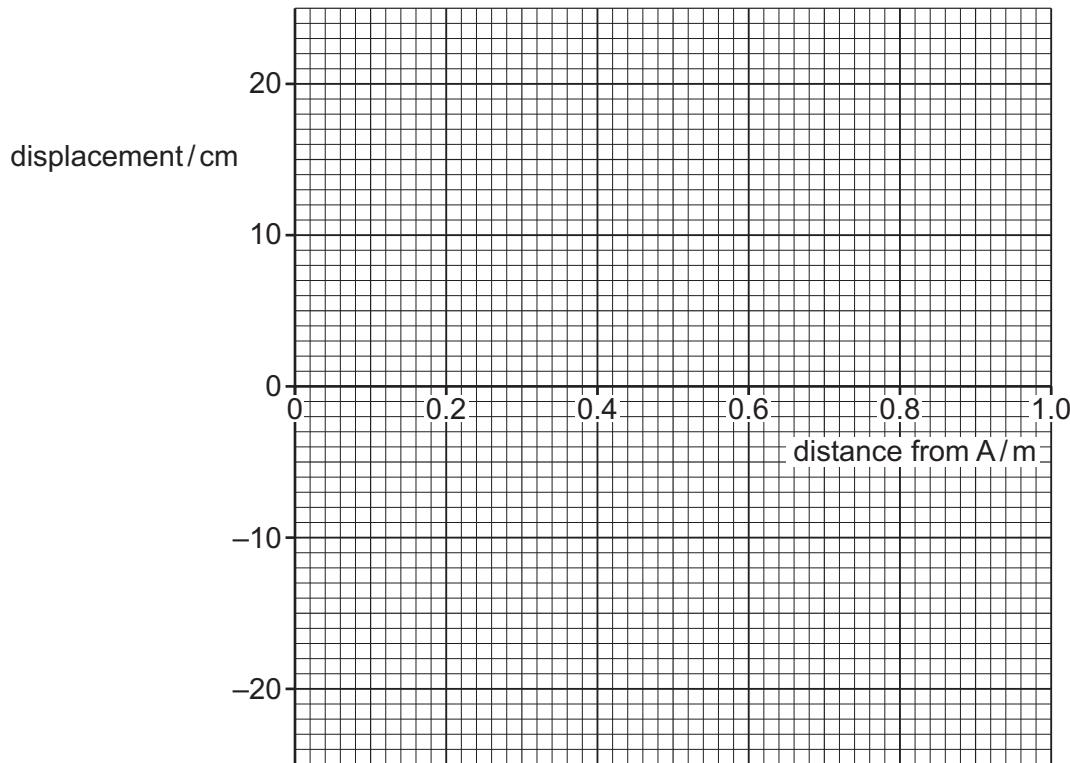


Fig. 3.2

[2]

- (d) The intensity of wave X is I_X . The intensity of wave Y is I_Y .

Use Fig. 3.1 to determine the ratio $\frac{I_X}{I_Y}$.

ratio = [2]

[Total: 8]