

- 7 An arrangement that is used to demonstrate interference with waves on the surface of water is shown in Fig. 7.1.

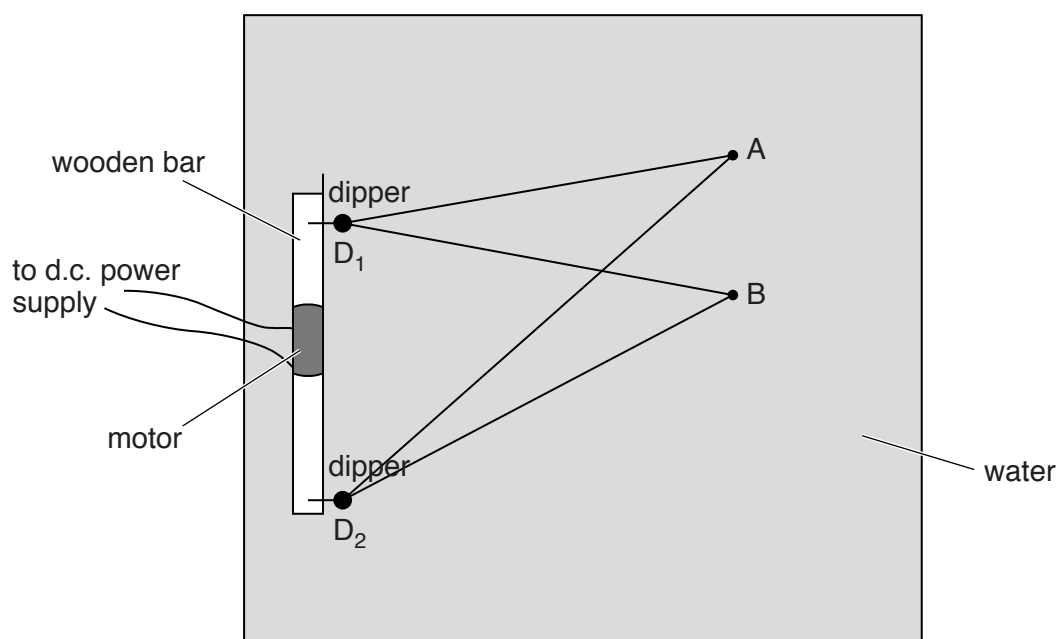


Fig. 7.1 (view from above)

- (a) Two dippers D_1 and D_2 are connected to a motor and a d.c. power supply. Initially only D_1 vibrates on the water surface to produce waves. The variation with distance x from D_1 of the displacement y of the water at one instant of time is shown in Fig. 7.2.

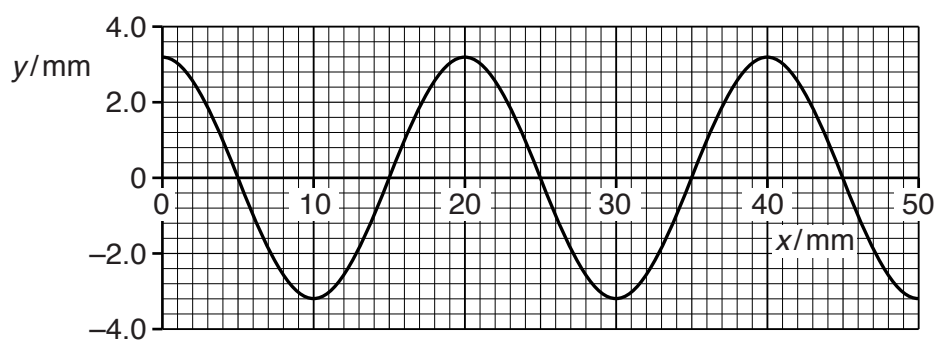


Fig. 7.2

Using Fig. 7.2, determine

- (i) the amplitude of the wave,

amplitude = mm [1]

- (ii) the wavelength of the wave.

wavelength = mm [1]

- (b) The two dippers D_1 and D_2 are made to vibrate and waves are produced by both dippers on the water surface.

- (i) State and explain whether these waves are stationary or progressive.

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[1]

- (ii) Explain why D_1 and D_2 are connected to the same motor.

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[1]

- (c) The points A and B on Fig. 7.1 are at the distances from D_1 and D_2 shown in Fig. 7.3.

D_1A	D_2A	D_1B	D_2B
5.0 cm	7.0 cm	5.0 cm	6.0 cm

Fig. 7.3

State and explain the variation with time of the displacement of the water on the surface at

- (i) A,

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[2]

- (ii) B.

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[1]