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

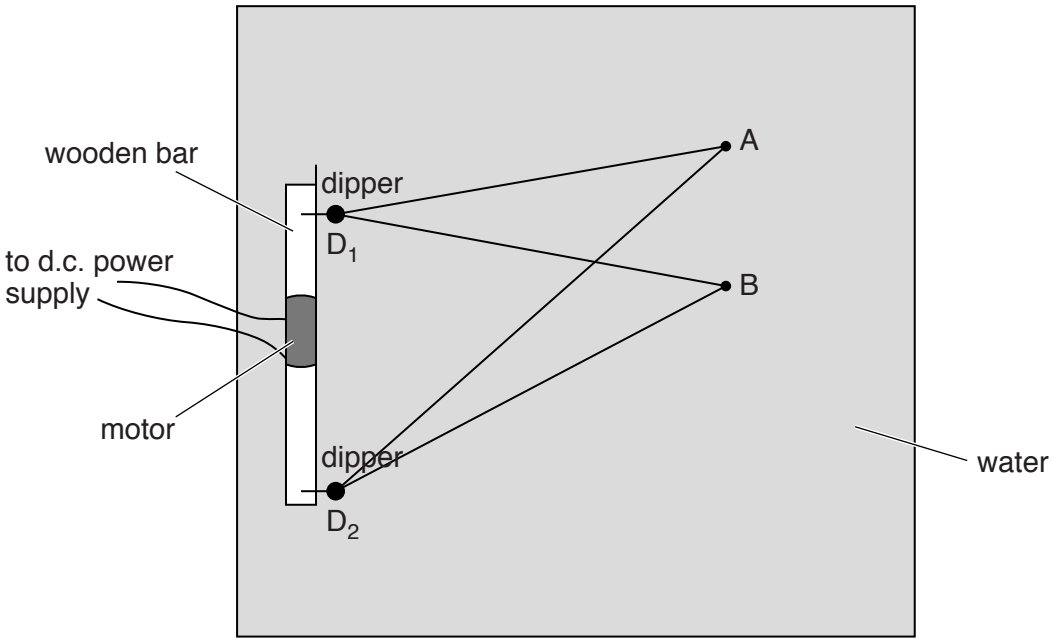

Fig. 7.1 (view from above)

(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.

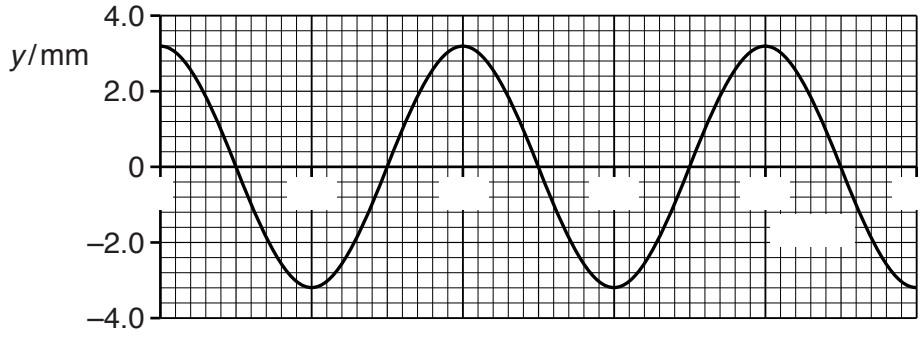

Fig. 7.2

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.

.....

.....[1]

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

.....

.....[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,

.....

.....

.....

.....[2]

(ii) B.

.....

.....

.....[1]