4 A progressive transverse wave travelling from left to right is shown at an instant in time in Fig. 4.1.

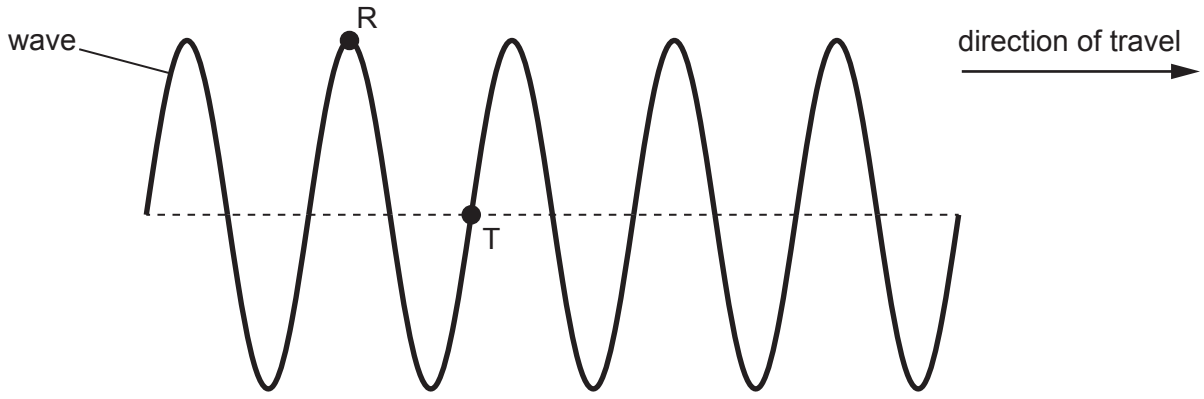

Fig. 4.1

R and T are points on the wave.

(a) State the phase difference between the points R and T.

phase difference = ... ° [1]

(b) On Fig. 4.1, draw an arrow at point T to show the direction of movement of point T at the instant shown. [1]

(c) The horizontal distance between R and T is 0.62 cm, as shown in Fig. 4.2.

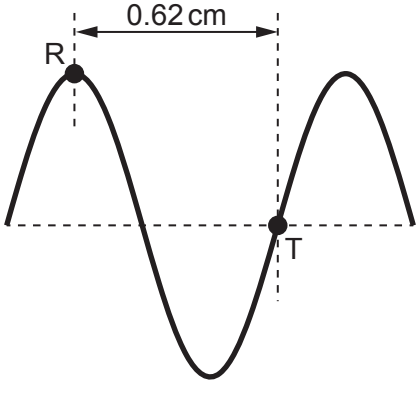

Fig. 4.2 (not to scale)

The speed of the wave is 0.27 m s^{-1}.

Calculate the frequency of the wave.

frequency = ... Hz [3]

(d) The wave is a water wave produced by a dipper S_1 attached to a vibrator in a ripple tank.

An identical dipper S_2 is attached to the same vibrator. The two dippers produce an interference pattern on the water in the tank, as shown in Fig. 4.3.

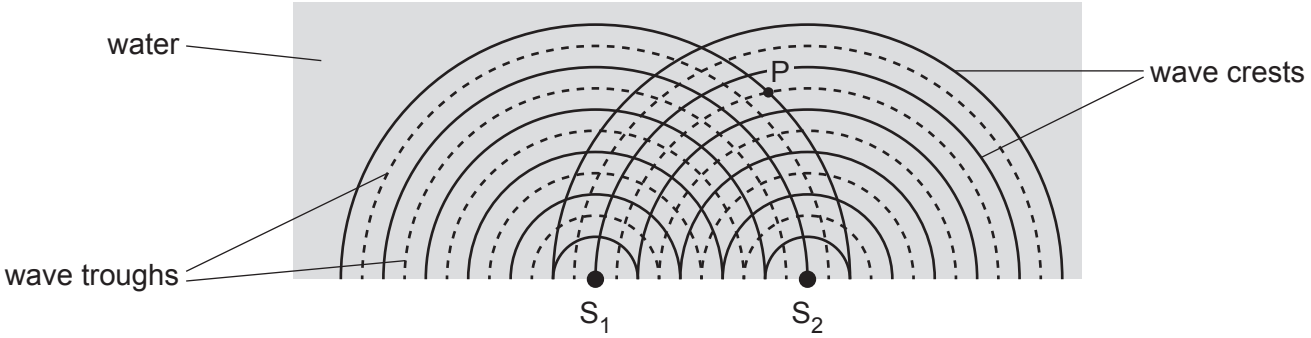

Fig. 4.3 (not to scale)

The wave crests from each source are represented by solid lines on Fig. 4.3 and the wave troughs are represented by dashed lines.

At point P in Fig. 4.3, the wave from S_1 has the same amplitude *A* as the wave from S_2.

Describe and explain the amplitude of the resultant wave at point P.

.....

.....

.....

..... [3]

[Total: 8]