

- 4 A child sits on the ground next to a remote-controlled toy car. At time $t = 0$, the car begins to move in a straight line directly away from the child. The variation with time t of the velocity of the car along this line is shown in Fig. 4.1.

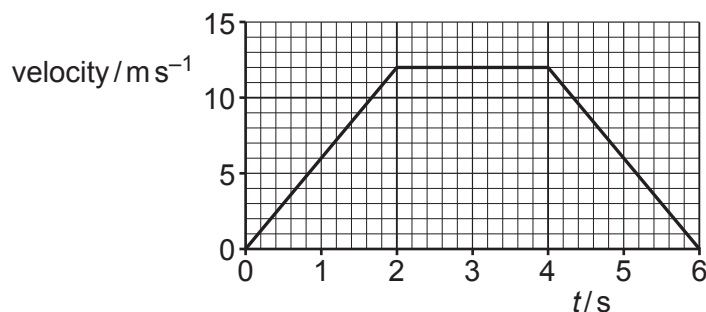


Fig. 4.1

The car's horn continually emits sound of frequency 925 Hz between time $t = 0$ and time $t = 6.0$ s. The speed of the sound in the air is 338 m s^{-1} .

- (a) Describe qualitatively the variation, if any, in the frequency of the sound heard, by the child, that was emitted from the car horn:

- (i) from time $t = 0$ to time $t = 2.0$ s

..... [1]

- (ii) from time $t = 4.0$ s to time $t = 6.0$ s.

..... [1]

- (b) Determine the frequency, to three significant figures, of the sound heard, by the child, that was emitted from the car horn at time $t = 3.0$ s.

frequency = Hz [2]

11

(c) Determine the time taken for the sound emitted at time $t = 4.0\text{ s}$ to travel to the child.

time taken = s [2]