

- 5 A foghorn makes a loud, low-pitched warning sound when a ship is moving in fog.



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- (a) What is the relationship between the frequency of a sound wave and the pitch of the sound?

(1)

- (b) The foghorn emits sound waves with a frequency of 160 Hz.

The speed of sound is 340 m/s.

- (i) State the equation linking wave speed, frequency and wavelength.

(1)

- (ii) Calculate the wavelength of these sound waves.

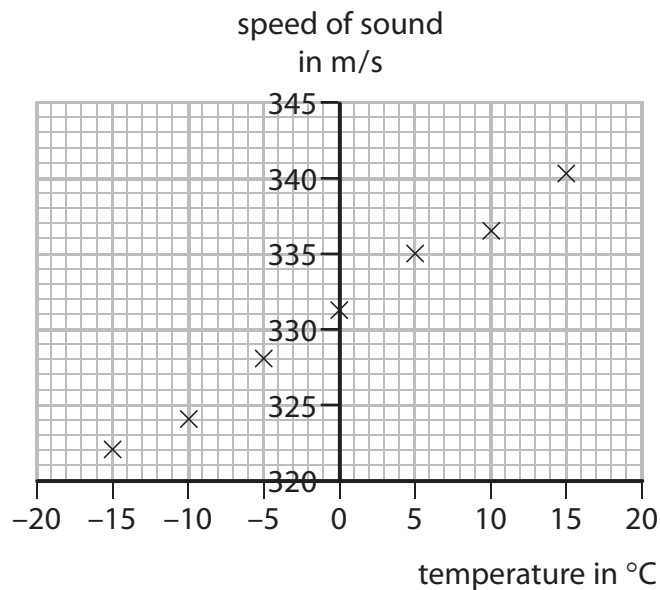
(2)

wavelength = ..... m



- (c) A student investigates how the speed of sound in air varies with temperature.

The student's results are shown on the graph.



- (i) Draw a straight line of best fit on the graph. (1)

- (ii) Use the graph to find the speed of sound when the air temperature is 20 °C. (2)

speed of sound = ..... m/s

- (d) The air temperature decreases while the foghorn continues to emit sound waves with a frequency of 160 Hz.

Explain how this decrease in temperature affects the wavelength of the sound waves.

(2)

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**(Total for Question 5 = 9 marks)**

