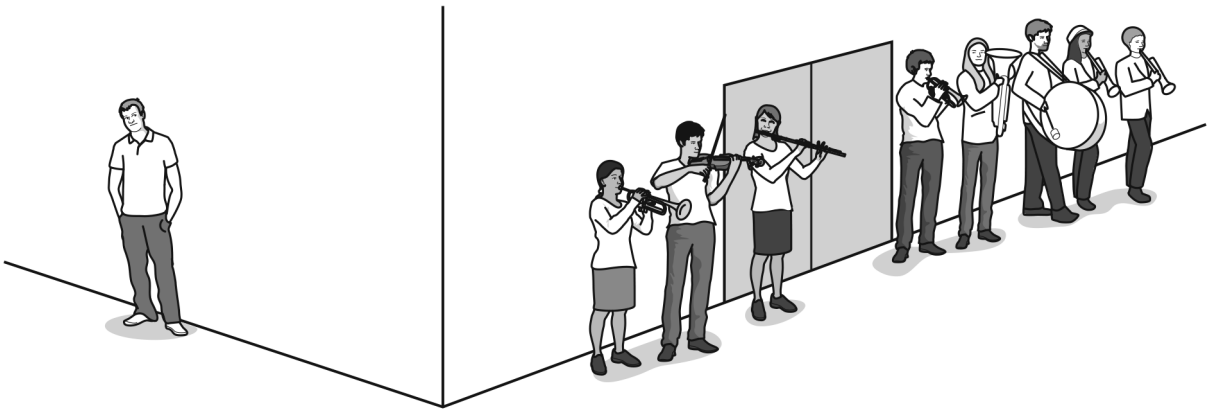
1 The speed of sound in air is 340 m / s.

Calculate the range of wavelengths for sounds that are audible by a healthy human ear.

wavelengths range from ..... to .....
[2]

[Total: 2]

2 The diagram shows a band in front of a building.



The drum produces a low frequency sound. Other musical instruments produce a high frequency sound. These sounds are equally loud.

A young man at the side of the building hears the drum but not the high frequency sounds from the other musical instruments.

Explain why this happens.

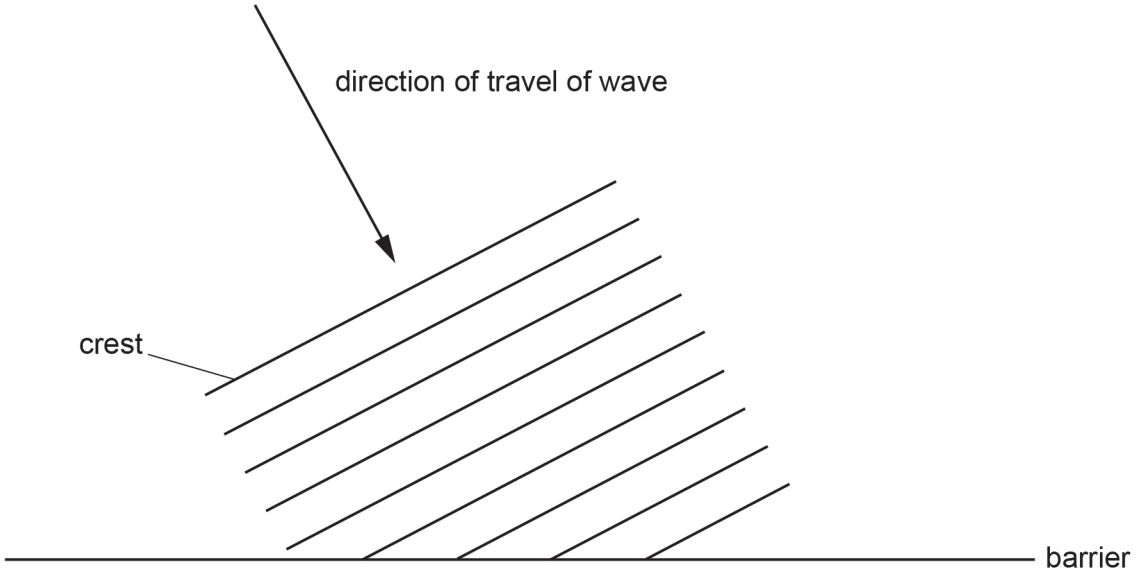
.....

.....

..... [3]

[Total: 3]

3 The diagram shows crests of a wave approaching a barrier where the wave is reflected.



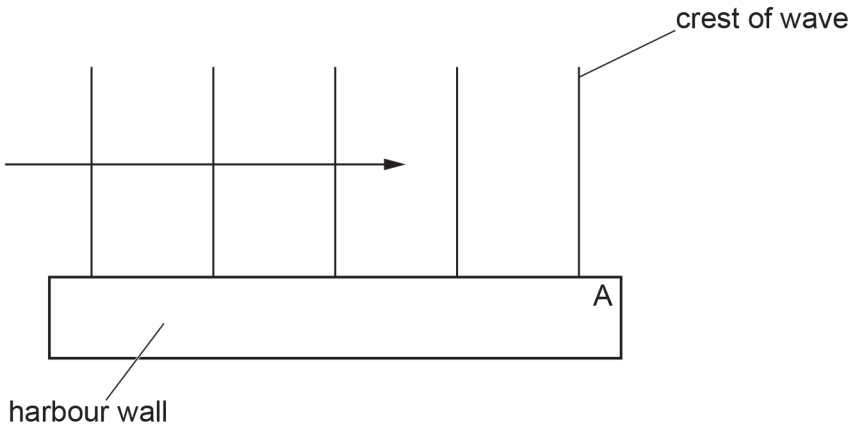
The wave has a wavelength of 36 cm and a speed of 1.2 m / s.

Calculate the frequency of the wave.

frequency = ... [3]

[Total: 3]

4 The diagram shows crests of a water wave moving from left to right in a harbour.



(a) On the diagram, draw three more crests to the right of point A. [2]

(b) State the name of the wave process that occurs as the wave passes point A.

..... [1]

[Total: 3]

5 Complete the following sentences.

An echo is the name for a reflected ..... wave.

The waves that form an echo are a type of longitudinal wave. Longitudinal waves are

made up of ..... and rarefactions. [2]

[Total: 2]

6 A person uses a surfboard to ride every 30th wave crest towards the beach. The wave crest travels at a speed of 1.6 m / s and the distance between each wave crest is 24 m.

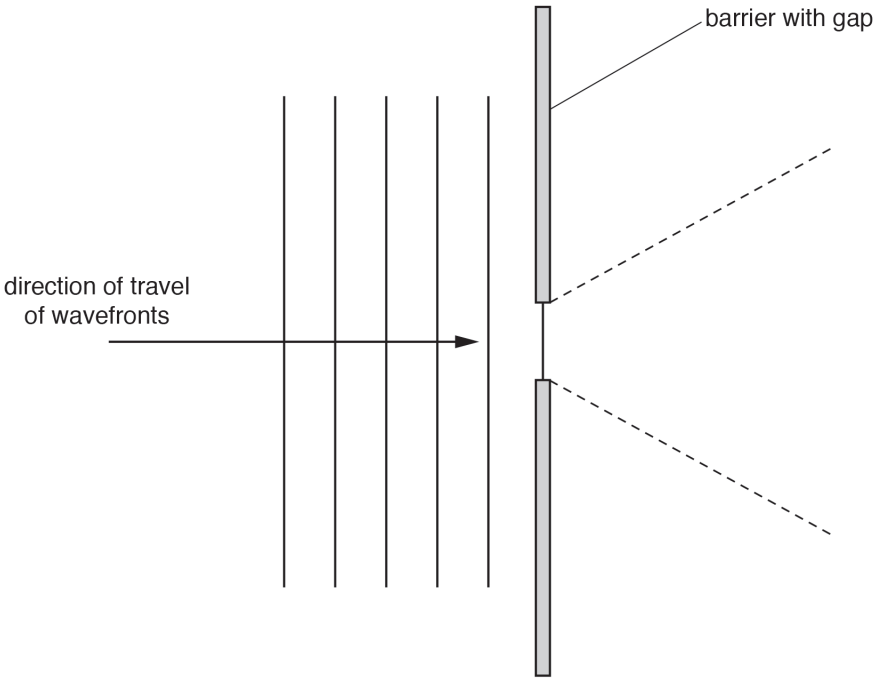
How many wave crests does the person surf in one hour?

A 1 **B** 2 **C** 8 **D** 450

[1]

[Total: 1]

7 The diagram represents wavefronts of a water wave on the surface of water approaching a gap in a barrier.



(a) The wavefronts to the right of the barrier spread out as far as the dashed lines in the diagram.

(i) State the name of the process of spreading out.

..... [1]

(ii) Draw **four** wavefronts to the right of the barrier.

[2]

(b) **(i)** State the effect of increasing the width of the gap in the barrier.

.....

..... [1]

(ii) State and explain the effect of decreasing the frequency of the water wave.

.....

.....

..... [2]

[Total: 6]

8 Calculate the wavelength in a vacuum of X-rays of frequency 1.3×10^{17} Hz.

wavelength = ... [3]

[Total: 3]