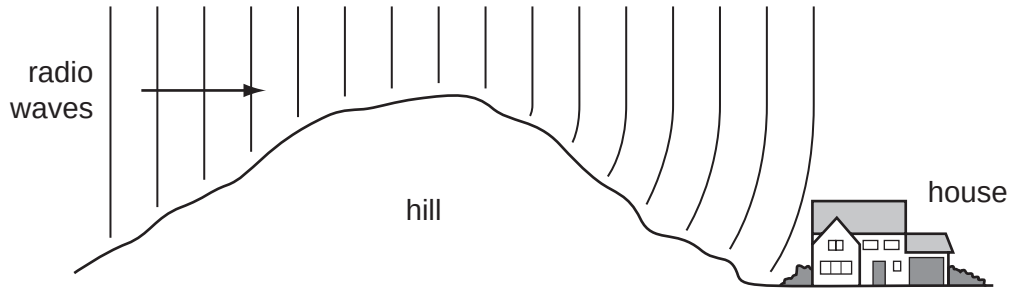
1 Radio waves are received at a house at the bottom of a hill.



The waves reach the house because the hill has caused them to be

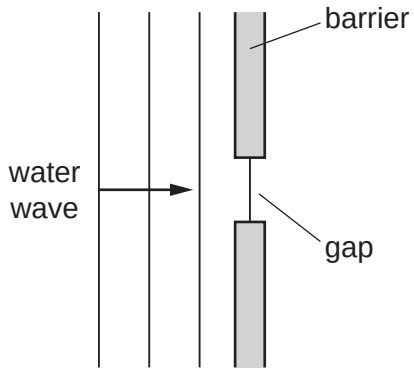
A diffracted.

B radiated.

C reflected.

D refracted.

2 A water wave in a shallow tank passes through a gap in a barrier.



What happens to the speed and what happens to the wavelength of the wave as it passes through the gap?

	speed	wavelength
A	decreases	decreases
B	decreases	remains constant
C	remains constant	decreases
D	remains constant	remains constant

3 Which is a unit of wavelength?

A hertz

B metre

C metre per second

D second

4 Which list contains only transverse waves?

A infra-red waves, light waves, sound waves

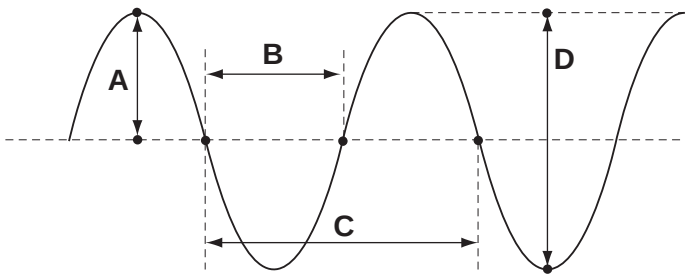
B infra-red waves, light waves, ultraviolet waves

C infra-red waves, sound waves, ultraviolet waves

D light waves, sound waves, ultraviolet waves

5 The diagram shows a wave.

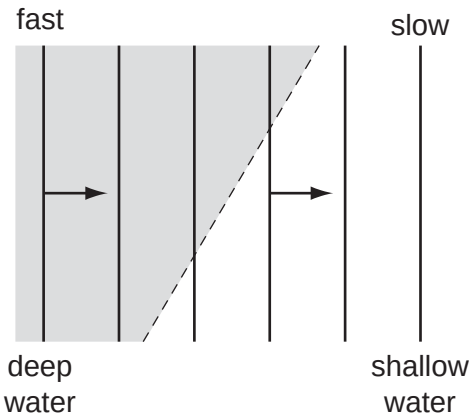
Which labelled distance is the wavelength?



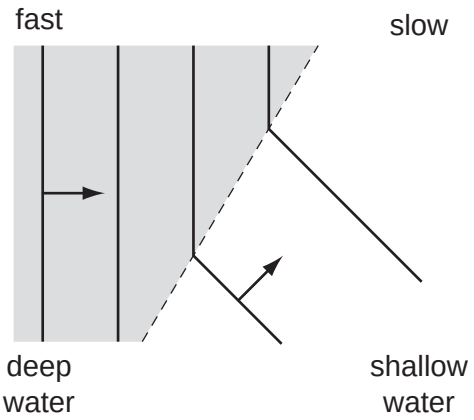
6 The diagrams show water waves that move more slowly after passing into shallow water.

Which diagram shows what happens to the waves?

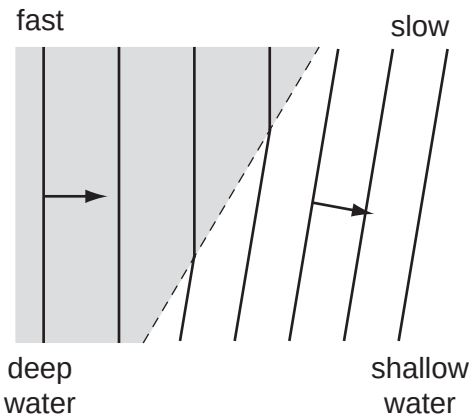
A



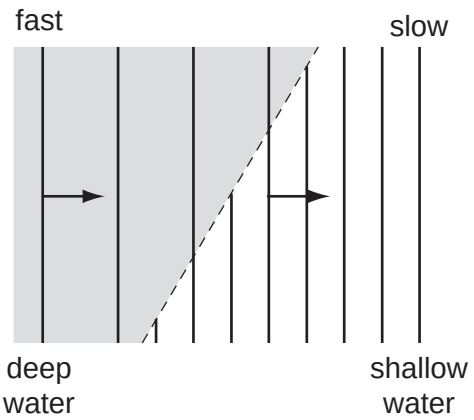
B



C



D



7 What is the number of wavefronts per second that pass a fixed point?

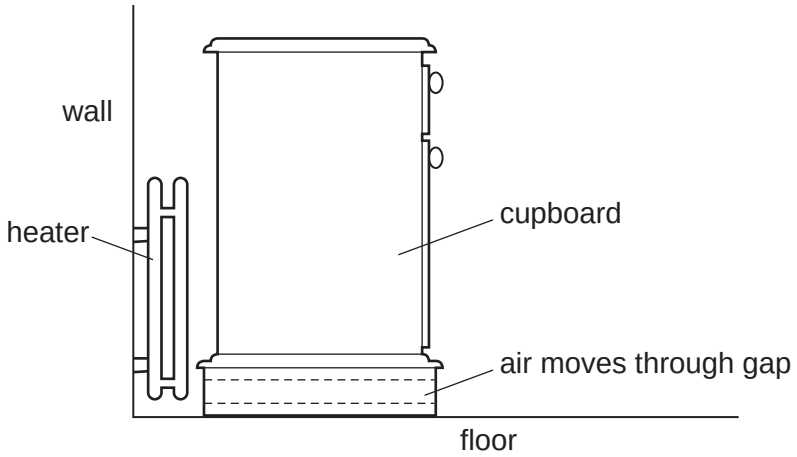
A the amplitude of the wave

B the frequency of the wave

C the speed of the wave

D the wavelength of the wave

8 A cupboard is placed in front of a heater. Air can move through a gap under the cupboard.

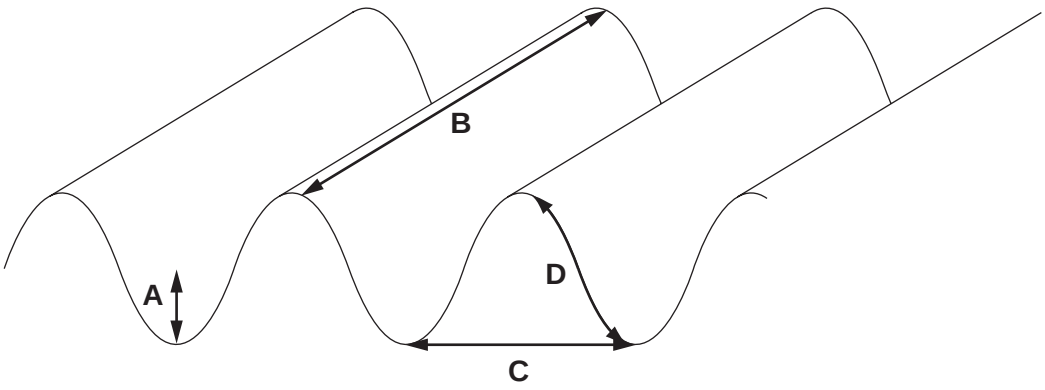


Which row describes the temperature, and the direction of movement, of the air in the gap?

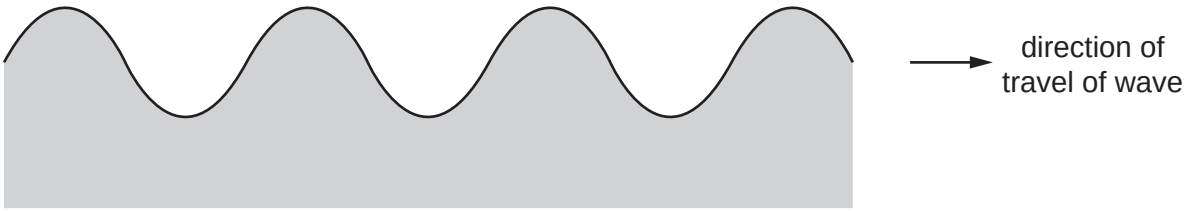
	air temperature	air direction
A	cool	away from the heater
B	cool	towards the heater
C	warm	away from the heater
D	warm	towards the heater

9 The diagram shows a water wave in a ripple tank.

Which line represents a wavefront?



10 The diagram shows a side view of a water wave at a particular time. The diagram is drawn full size.



Which statement about the wave is correct?

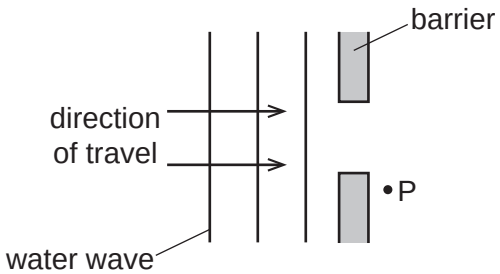
A The wave is longitudinal and the frequency can be measured from the diagram.

B The wave is longitudinal and the wavelength can be measured from the diagram.

C The wave is transverse and the frequency can be measured from the diagram.

D The wave is transverse and the wavelength can be measured from the diagram.

11 The diagram shows a water wave approaching a barrier with a gap.



The wave reaches point P.

What is the name of the effect that causes the wave to reach point P?

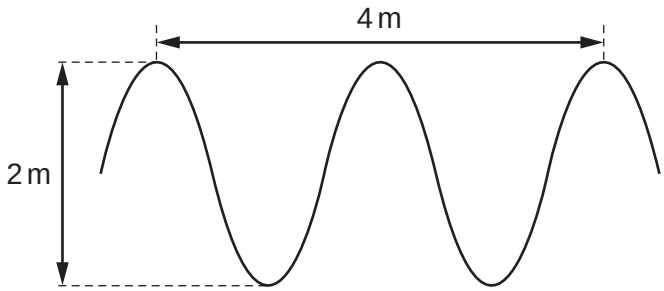
A diffraction

B dispersion

C reflection

D refraction

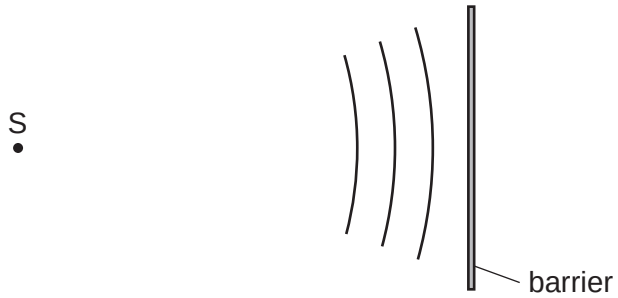
12 The diagram represents a water wave.



Which row shows the amplitude and the wavelength of the wave?

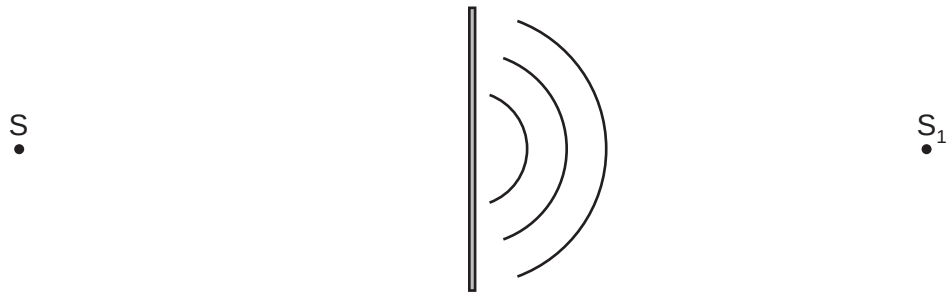
	amplitude / m	wavelength / m
A	1	2
B	1	4
C	2	2
D	2	4

13 The diagram represents circular wavefronts coming from point S. The wavefronts strike a barrier and are reflected so that they appear to come from point S_1.

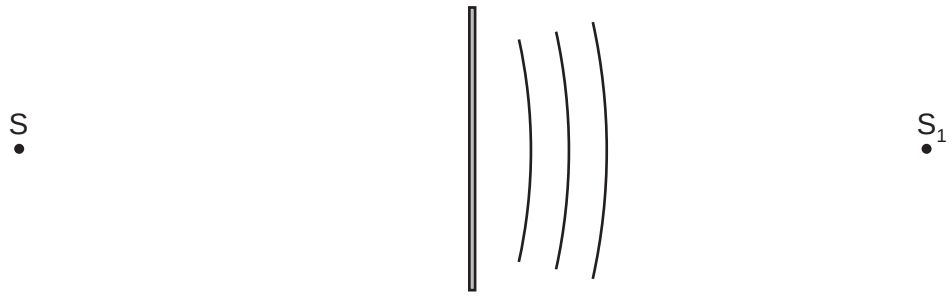


Which diagram shows the reflected wavefronts?

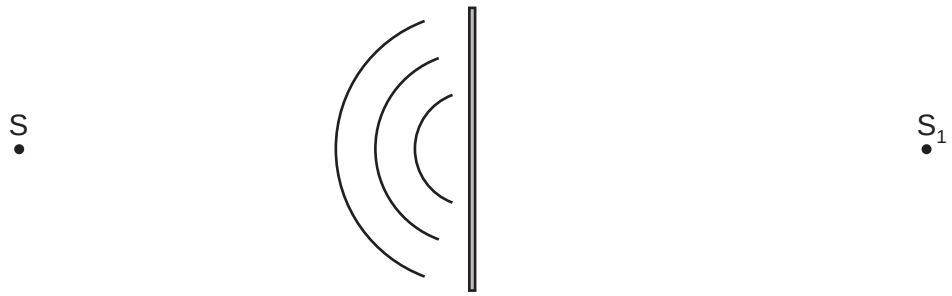
A



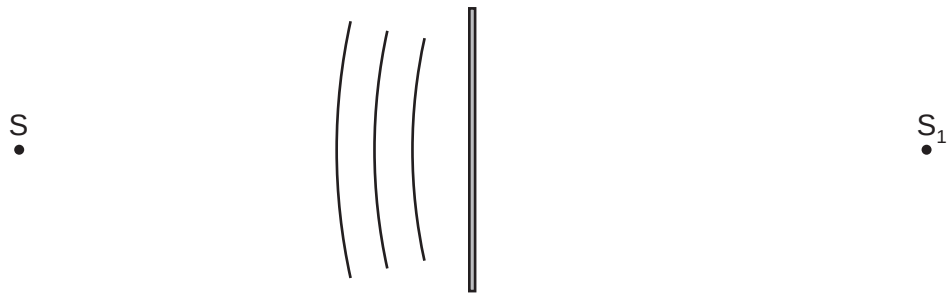
B



C



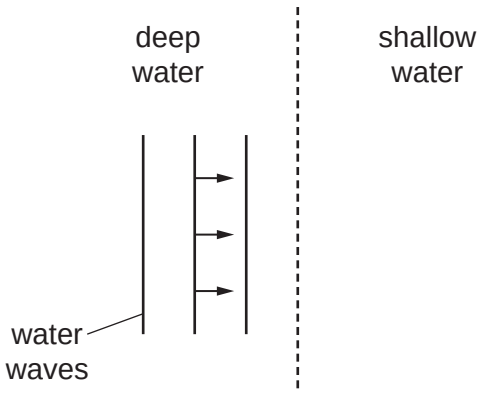
D



14 Which row correctly defines a type of wave and gives a correct example?

	wave type	direction of vibrations	example
A	longitudinal	parallel to direction of wave travel	radio waves
B	longitudinal	perpendicular to direction of wave travel	light waves
C	transverse	parallel to direction of wave travel	light waves
D	transverse	perpendicular to direction of wave travel	radio waves

15 A water wave moves quickly in deep water.



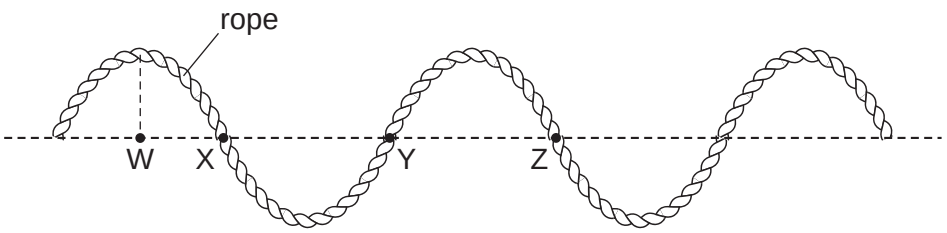
The wave now enters shallow water and its speed decreases.

Which row shows what happens to the frequency of the wave, and what happens to the wavelength of the wave?

	frequency	wavelength
A	decreases	decreases
B	decreases	does not change
C	does not change	decreases
D	does not change	does not change

16 A transverse wave moves along a rope.

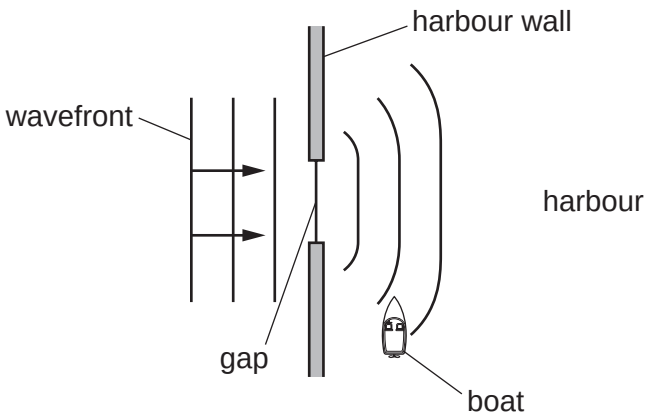
The diagram shows the position of the rope at one particular time.



Which two labelled points are one wavelength apart?

A W and X **B** W and Z **C** X and Z **D** Y and Z

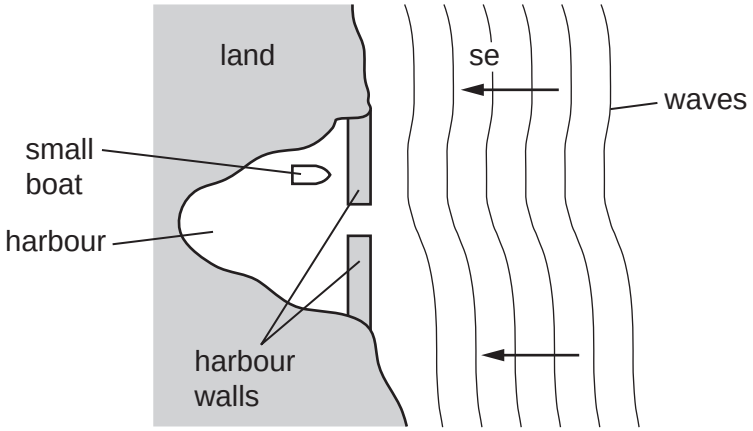
17 The diagram shows a water wave passing through a gap in a harbour wall. The wavefronts curve round the wall and reach a small boat in the harbour.



What is the name of this curving effect, and how can the gap be changed so that the wavefronts do not reach the boat?

	name of effect	change to the gap
A	diffraction	make the gap slightly bigger
B	diffraction	make the gap slightly smaller
C	refraction	make the gap slightly bigger
D	refraction	make the gap slightly smaller

18 A small boat in a harbour is protected from waves on the sea by harbour walls.



Some waves can curve round the harbour walls and reach the boat.

What is the name of this effect?

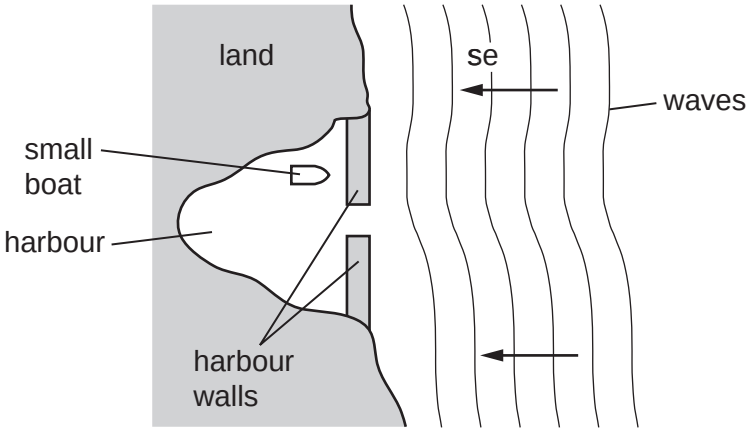
A diffraction

B dispersion

C reflection

D refraction

19 A small boat in a harbour is protected from waves on the sea by harbour walls.



Some waves can curve round the harbour walls and reach the boat.

What is the name of this effect?

A diffraction

B dispersion

C reflection

D refraction

20 Which list shows electromagnetic waves in order of increasing frequency?

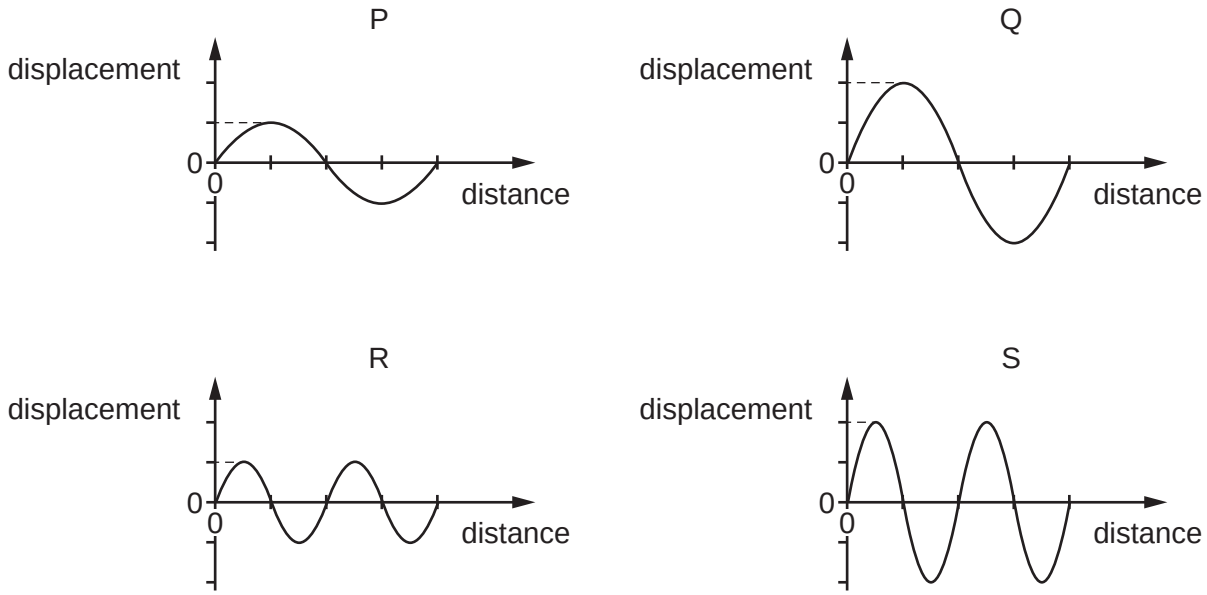
A visible light, X-rays, γ-rays

B visible light, γ-rays, X-rays

C X-rays, γ-rays, visible light

D γ-rays, X-rays, visible light

21 The diagram shows four waves drawn to the same scale.



Which statement is correct?

A The amplitude of wave P is the same as the amplitude of wave R.

B The amplitude of wave S is double the amplitude of wave Q.

C The wavelength of wave Q is double the wavelength of wave P.

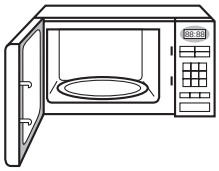
D The wavelength of wave S is the same as the wavelength of wave Q.

22 Which waves are longitudinal?

A

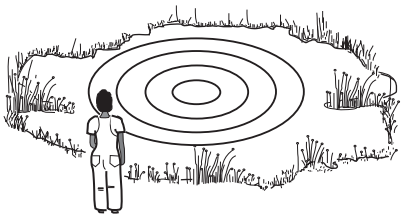
light waves
from a lamp

B



microwaves
in an oven

C

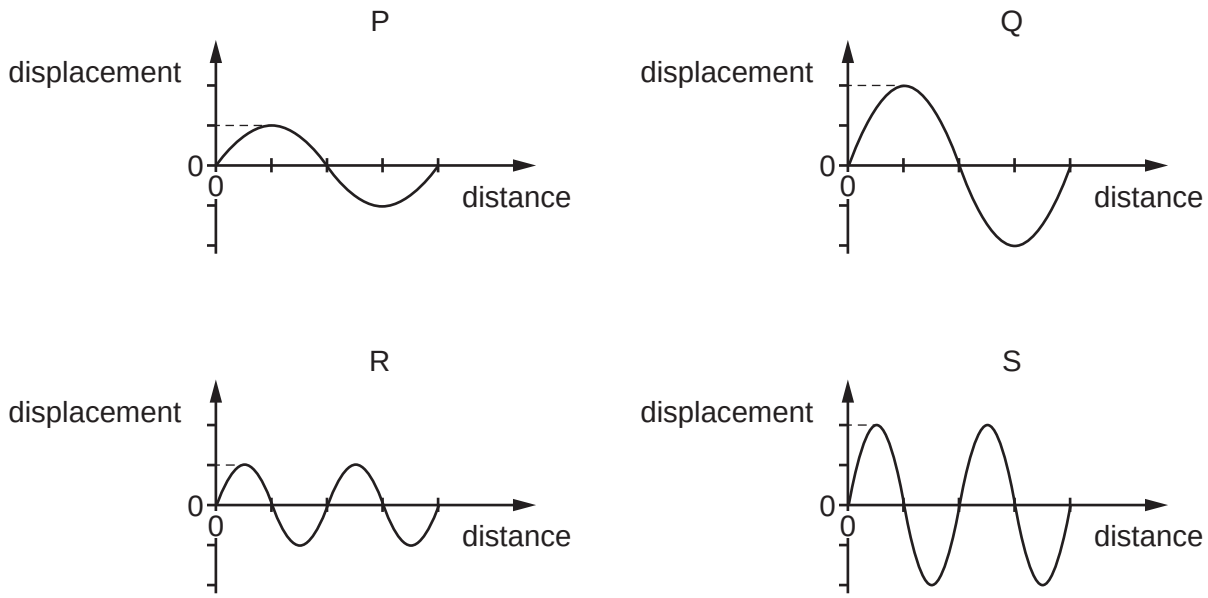


water waves
on a pond

D

sound waves
from a trumpet

23 The diagram shows four waves drawn to the same scale.



Which statement is correct?

A The amplitude of wave P is the same as the amplitude of wave R.

B The amplitude of wave S is double the amplitude of wave Q.

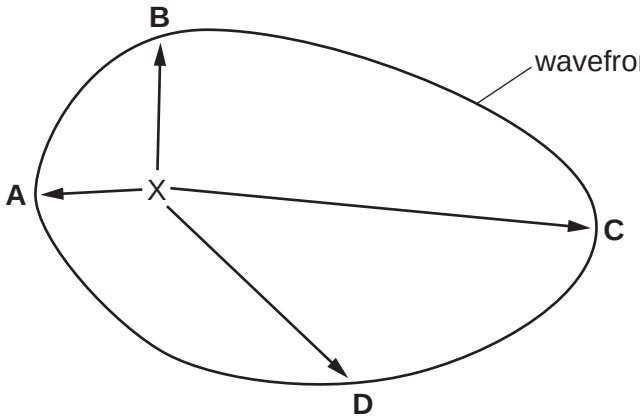
C The wavelength of wave Q is double the wavelength of wave P.

D The wavelength of wave S is the same as the wavelength of wave Q.

24 Waves travel more quickly on the surface of water when the water is deep.

A stone is dropped at point X into a pool of varying depth. The diagram shows the first wavefront on the surface of the pool.

The region between X and which labelled point is likely to be the deepest?

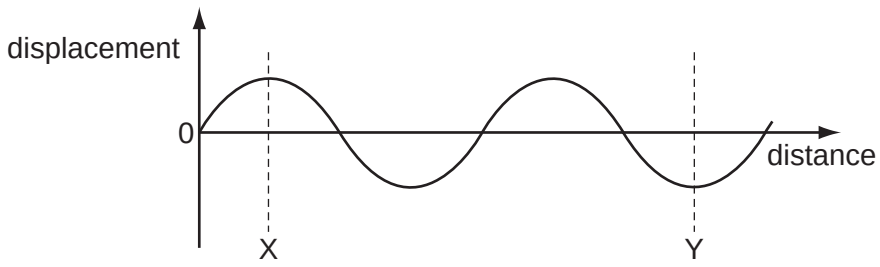


25 Visible light and γ-rays are both waves.

How may they correctly be described?

	visible light	γ-rays
A	longitudinal	longitudinal
B	longitudinal	transverse
C	transverse	longitudinal
D	transverse	transverse

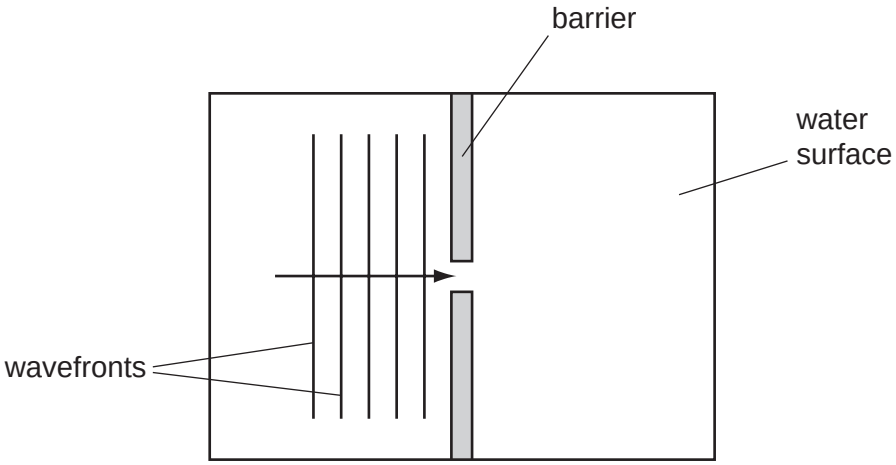
26 The diagram represents a wave.



How many wavelengths are there between X and Y?

A $\frac{2}{3}$ **B** 1 **C** $1\frac{1}{2}$ **D** 3

27 The diagram shows the surface of water in a ripple tank. A wave is travelling in the direction of the arrow towards a gap in a barrier.



What happens to the wave as it passes through the gap, and what happens to the shape of the wavefronts after passing through the gap?

	what happens at the gap	shape after passing through the gap
A	diffraction	curved
B	diffraction	straight
C	refraction	curved
D	refraction	straight

28 Which row shows an example of a transverse wave and an example of a longitudinal wave?

	transverse	longitudinal
A	light	radio
B	radio	sound
C	sound	water
D	water	light

29 A boy throws a small stone into a pond. Waves spread out from where the stone hits the water and travel to the side of the pond.

The boy notices that eight waves reach the side of the pond in a time of 5.0 s.

What is the frequency of the waves?

A 0.20 Hz **B** 0.63 Hz **C** 1.6 Hz **D** 40 Hz

30 What is the unit of wavelength?

A hertz

B metre

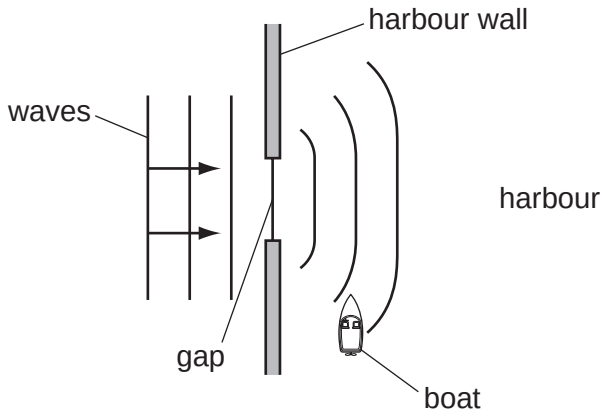
C metre per second

D second

31 Which row correctly describes light waves and radio waves?

	light waves	radio waves
A	longitudinal	longitudinal
B	longitudinal	transverse
C	transverse	longitudinal
D	transverse	transverse

32 The diagram shows water waves passing through a gap in a harbour wall. The waves curve round the wall and reach a small boat in the harbour.



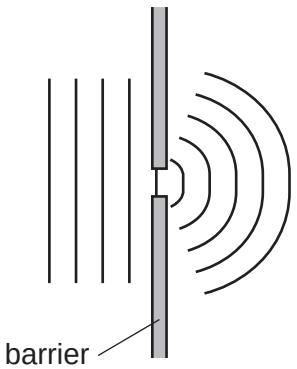
What is the name of this curving effect, and how can the gap be changed so that the waves are less likely to reach the boat?

	name of effect	change to the gap
A	diffraction	make the gap slightly bigger
B	diffraction	make the gap slightly smaller
C	refraction	make the gap slightly bigger
D	refraction	make the gap slightly smaller

33 Which row shows the nature of light waves, sound waves and X-rays?

	light waves	sound waves	X-rays
A	longitudinal	longitudinal	transverse
B	longitudinal	transverse	longitudinal
C	transverse	longitudinal	transverse
D	transverse	transverse	longitudinal

34 The diagram shows plane water waves passing through a narrow gap in a barrier.



The waves spread out on the far side of the barrier.

Which property of waves does this illustrate?

A diffraction

B reflection

C refraction

D vibration

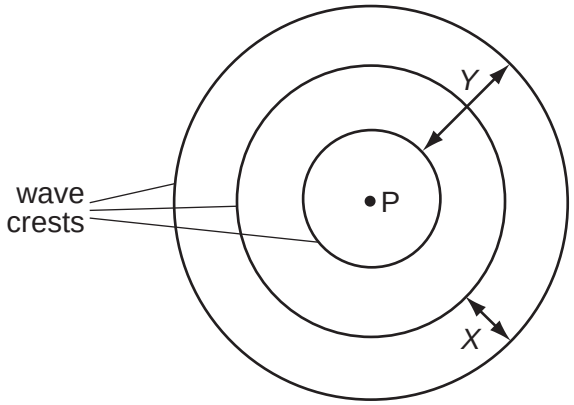
35 Water waves can be used to show reflection, refraction and diffraction.

For each of these, which row shows whether or not the speed of the water waves changes?

	reflection	refraction	diffraction
A	no	no	yes
B	no	yes	no
C	yes	no	no
D	yes	yes	yes

36 A vertical stick is dipped up and down in water at P.

In two seconds, three wave crests are produced on the surface of the water.



Which statement is correct?

A Distance *X* is the amplitude of the waves.

B Distance *Y* is the wavelength of the waves.

C Each circle represents a wavefront.

D The frequency of the waves is 3 Hz.

37 Which of these waves is longitudinal?

A infra-red

B radio

C sound

D water

38 Sound waves of frequency 2.0 kHz travel through a substance at a speed of 800 m / s.

What is the wavelength of the waves?

A 0.40 m **B** 2.5 m **C** 400 m **D** 1600 m

39 The frequency of a wave is doubled. The speed of the wave does not change.

What happens to the wavelength of the wave?

A It becomes four times as large.

B It does not change.

C It doubles.

D It halves.

40 A water wave passes into a region where the wave travels more slowly.

As it passes into the slow region, what happens to the frequency and what happens to the wavelength of the wave?

	frequency	wavelength
A	decreases	remains the same
B	increases	remains the same
C	remains the same	decreases
D	remains the same	increases

41 Which is a unit of wavelength?

A hertz

B metre

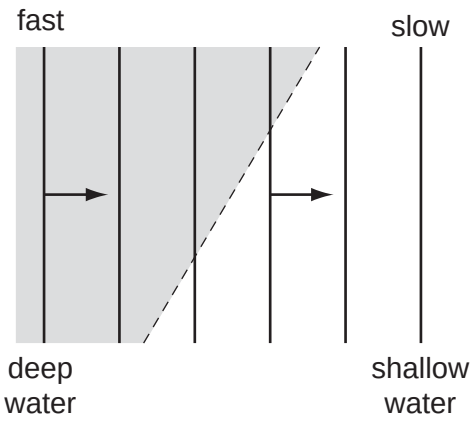
C metre per second

D second

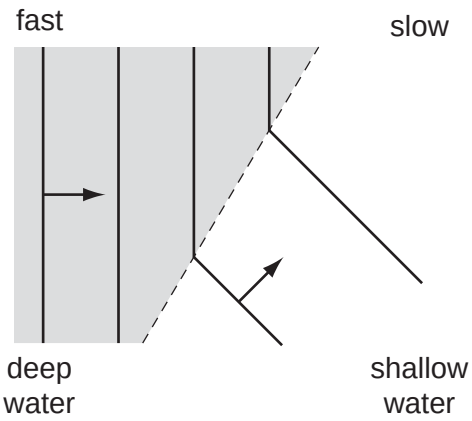
42 The diagrams show water waves that move more slowly after passing into shallow water.

Which diagram shows what happens to the waves?

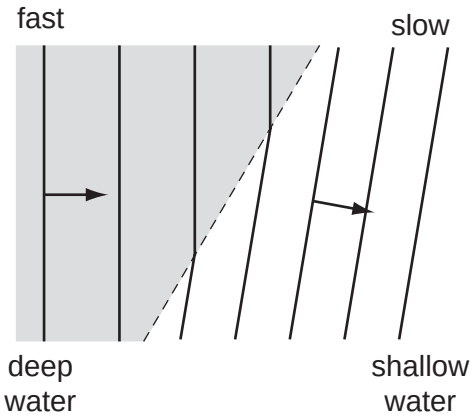
A



B



C



D