AQA GCSE Physics | 8463

SPECIFICATION POINT 4.6.1.3

Reflection of waves (physics only)

Past-paper questions

Tier	**Foundation**
Question groups	**18**
Available paper years	**2007–2025**

Using this booklet

1. Answer the questions in order and show your working.
2. Original question numbers and marks are retained.
3. Print at actual size (100%) for measuring questions.
4. Use the companion answer booklet to check your work.

Name: _____ **Date:** _____

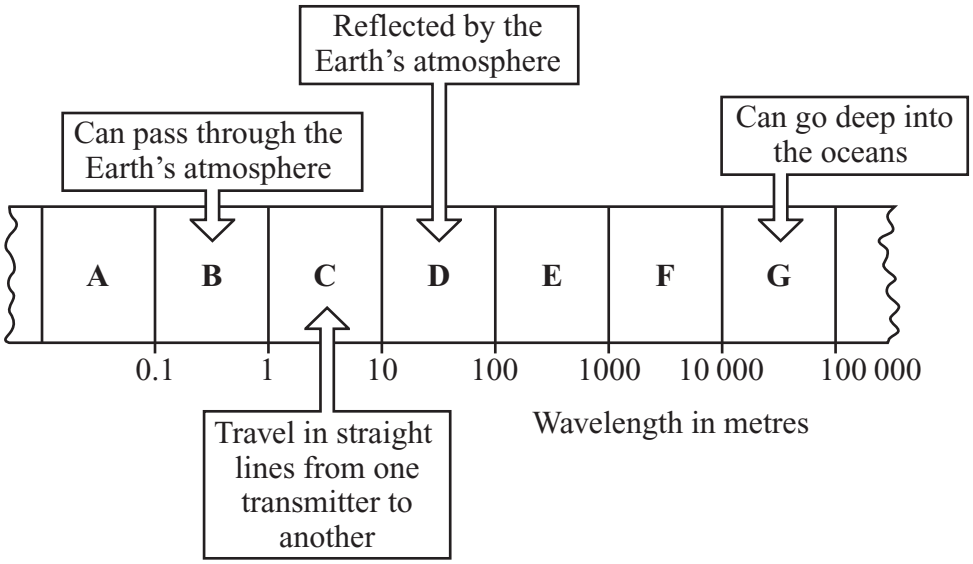
Whole questions are retained for context, so some parts assess other specification points. Current and legacy sources are labelled. Continue on extra paper if needed.

4.6.1.3 Reflection of waves (physics only)

Question 01

1 The diagram shows a small part of the electromagnetic spectrum divided into seven sections.

The different properties of the waves in each section make them useful in different ways.



The waves in which section, **A**, **B**, **C**, **D**, **E**, **F** or **G**, are:

(a) used to send a signal to a satellite in space

.....

(1 mark)

(b) used to communicate with a submarine under the water

.....

(1 mark)

(c) used by a radio station to broadcast programmes around the world

.....

(1 mark)

(d) the waves with the shortest wavelength?

.....

(1 mark)

4

4.6.1.3 Reflection of waves (physics only)

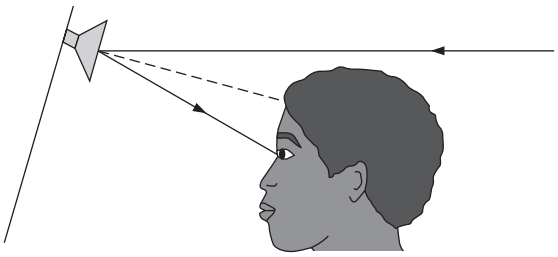
Question 02

January 2008 | PHY3F | Original Q2 | Legacy

2 (a) The diagram shows a motorist looking into her driving mirror.

(i) Mark on the diagram:

I to show the incident ray
r to show the angle of reflection.



(2 marks)

(ii) Name the dashed line shown in the diagram.

.....

(1 mark)

(b) List **A** gives the names of two types of mirror. List **B** shows how three types of mirror are represented in diagrams.

Draw a line from each type of mirror in list **A** to the correct mirror in list **B**.

List **A**	List **B**
Concave mirror	
Plane mirror	
	

(2 marks)

5

4.6.1.3 Reflection of waves (physics only)

Question 03

January 2008 | PHY3F | Original Q9 | Legacy

9 When sound waves reach a material, some of the energy of the sound is reflected and some is transmitted through the material.

(a) Complete the sentence.

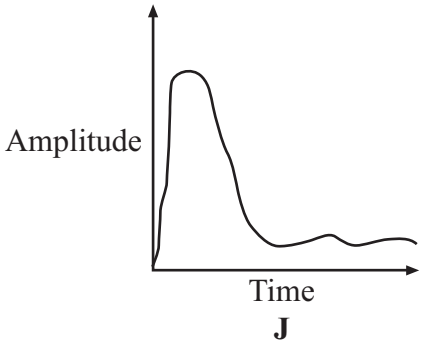
Sound waves are caused by ..... .

(1 mark)

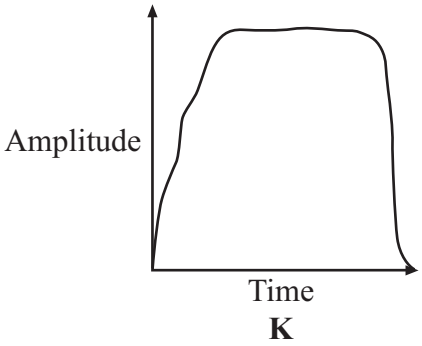
(b) The graphs **J**, **K**, **L** and **M** represent the sound energy reflected from a surface.

The graphs are all drawn to the same scale.

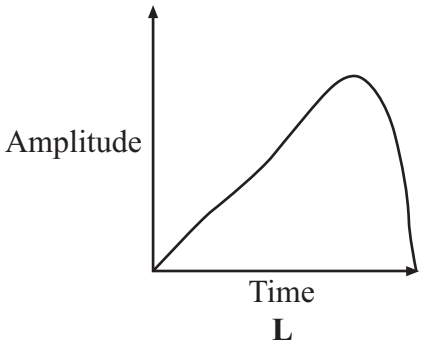
Which graph shows the greatest total sound energy output from the surface?



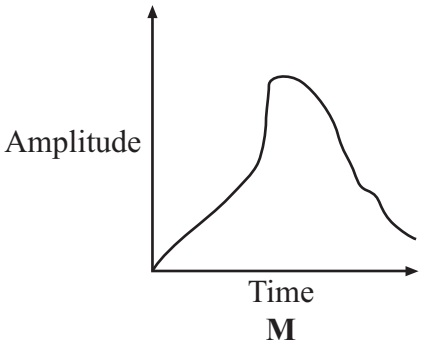
J



K



L



M

Graph .....

(1 mark)

Question 9 continues on the next page

4.6.1.3 Reflection of waves (physics only)

Question 03 · continued

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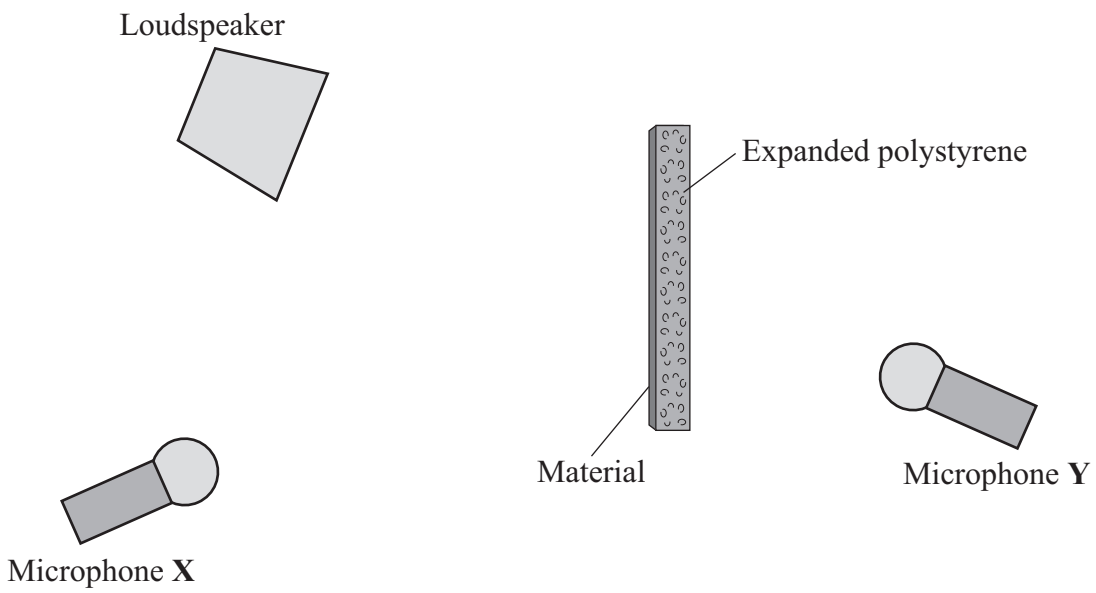
(c) The proportion of the sound energy which is reflected or transmitted depends on the material which receives the sound.

A student investigates different materials.

The diagram shows how a student sets up her equipment.

(i) Using a pencil and ruler to draw on the diagram, show how microphone **X** receives reflected sound.



(2 marks)

(ii) The student tests four materials. Each sheet of material is 1 mm thick. This has been glued onto a block of expanded polystyrene.

Why does the student use the same size of expanded polystyrene block and the same sound level for each test?

.....

.....

(1 mark)

4.6.1.3 Reflection of waves (physics only)

Question 03 · continued

BLANK

(iii) The table shows the readings for the sound level transmitted to microphone **Y**.

Sound level from loudspeaker in arbitrary units	Surface material	Sound level transmitted to microphone Y in arbitrary units
60	paper	39
60	plaster	18
60	cloth	31
60	wood	15

[A] Which surface material transmits the smallest proportion of the sound?

.....

(1 mark)

[B] What proportion is this?

.....

(1 mark)

(d) People living in a flat have very noisy neighbours who are always playing loud music.

Suggest **one** practical idea to reduce the amount of noise transmitted into the flat through the walls and explain how your idea will work.

.....

.....

.....

.....

.....

.....

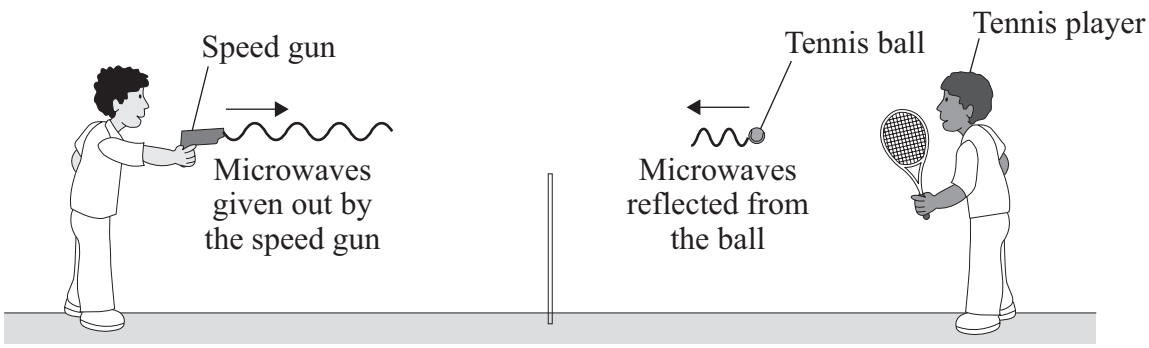
(2 marks)

9

4.6.1.3 Reflection of waves (physics only)

Question 04

2 (a) The picture shows a speed gun being used to measure how fast a tennis player hits the ball.



Some of the microwaves from the speed gun are absorbed by the ball and some are reflected by the ball.

2 (a) (i) Complete the following sentence by choosing **one** of the phrases from the box.

longer than	**the same as**	**shorter than**

The wavelength of the microwaves reflected from the ball are

..... the wavelength of the microwaves from the speed gun.

(1 mark)

2 (a) (ii) Complete the following sentence by drawing a ring around the correct line in the box.

When the ball absorbs microwaves, its temperature will

decrease slightly
not change
increase slightly

.

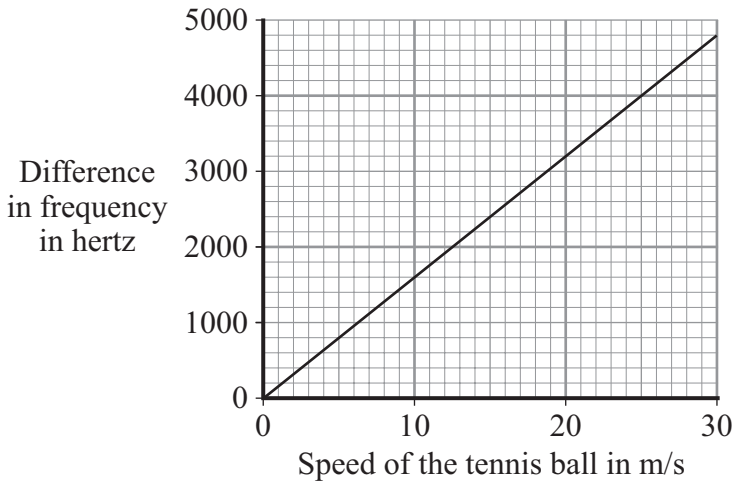
(1 mark)

4.6.1.3 Reflection of waves (physics only)

Question 04 · continued

for mark

2 (b) The microwaves reflected from the ball have a higher frequency than the microwaves from the speed gun.
The graph shows how the difference between the two frequencies depends on the speed of the ball.



2 (b) (i) Describe the pattern that links the difference between the two frequencies and the speed of the ball.

.....

.....

(1 mark)

2 (b) (ii) The speed gun measures the difference between the two frequencies as 3200 Hz.

Use the graph to find the speed of the tennis ball.
Show clearly on the graph how you obtain your answer.

Speed of the tennis ball = ... m/s

(2 marks)

2 (b) (iii) Which **one** of the following gives the reason why the data has been shown as a line graph and **not** as a bar chart?

Put a tick (✓) in the box next to your choice.

Frequency and speed are both categoric variables. ☐

Frequency and speed are both continuous variables. ☐

Speed is a continuous variable and frequency is a categoric variable. ☐

(1 mark)

6

4.6.1.3 Reflection of waves (physics only)

Question 05

January 2011 | PHY1F | Original Q6 | Legacy

6 Small sailing boats can be fitted with a passive radar device. The device increases the chance that the small boat will be seen on the radar screen of a large ship.
The radar transmitter on the large ship emits microwaves.

6 (a) Microwaves and radio waves are both part of the electromagnetic spectrum.

How are microwaves different from radio waves?

.....

.....

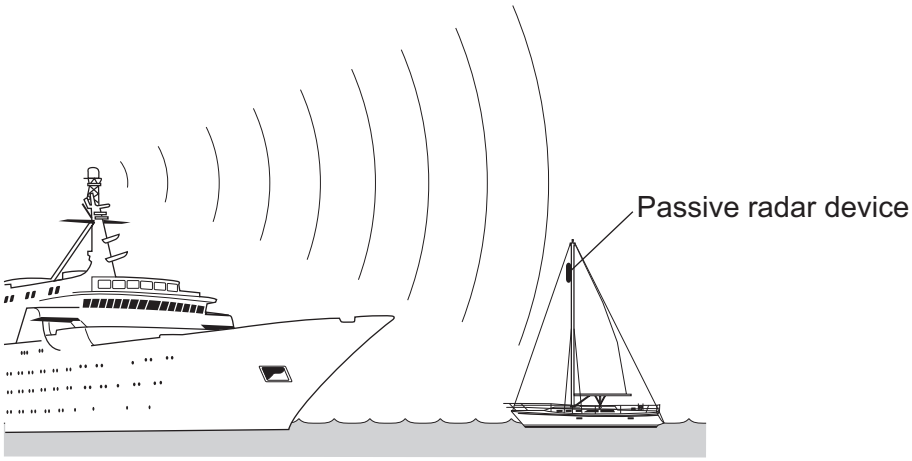
(1 mark)

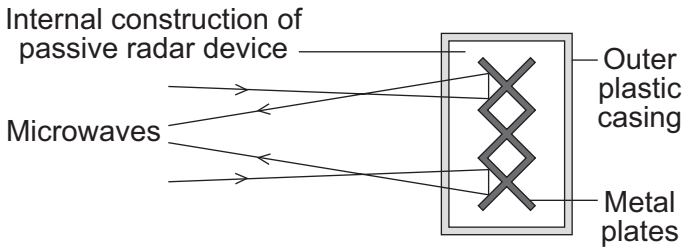
6 (b) How fast do microwaves travel through the air or a vacuum compared to radio waves?

.....

(1 mark)

6 (c) The diagrams show the position of a passive radar device on a small boat and the internal construction of one type of passive radar device.





4.6.1.3 Reflection of waves (physics only)

Question 05 · continued

Microwaves can be absorbed, reflected or transmitted by different materials and types of surface.

Explain what happens to the microwaves from the ship's transmitter when they reach the passive radar device.

.....

.....

.....

.....

(2 marks)

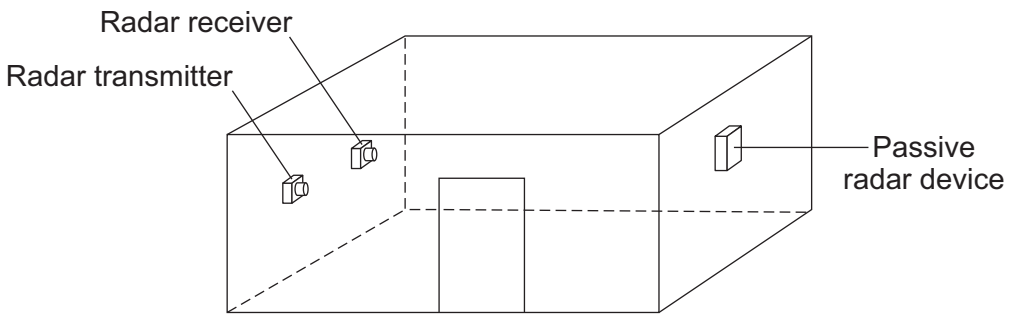
Question 6 continues on the next page

4.6.1.3 Reflection of waves (physics only)

Question 05 · continued

6 (d) Each type of passive radar device has an RCS value. The larger the RCS value, the easier it is for a small boat fitted with the device to be detected.

An independent group of scientists measured the RCS values of 4 different types of device. The RCS value for each device was measured in the same room using the same equipment.



6 (d) (i) Why are the walls of the room covered in a material that absorbs the waves emitted by the radar transmitter?

.....

.....

(1 mark)

6 (d) (ii) Why is it important to use the same room and the same equipment?

.....

.....

(1 mark)

6 (d) (iii) Why is it important that the measurements are made by an independent group of scientists?

.....

.....

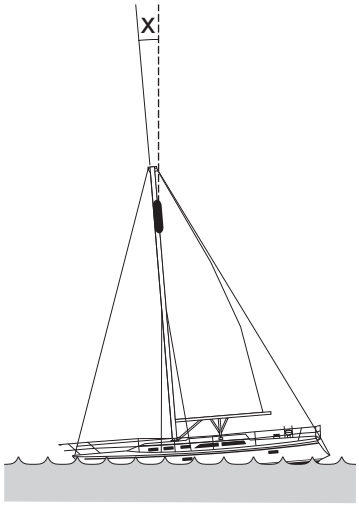
(1 mark)

4.6.1.3 Reflection of waves (physics only)

Question 05 · continued

6 (e) The movement of a small boat causes the mast and device to lean over, therefore the RCS values were measured at different angles.

The table gives the RCS values obtained by the scientists.



Device	Angle X			
	0°	5°	10°	15°
A	1.4	1.6	1.7	1.8
B	4.7	2.6	2.3	1.9
C	9.3	3.3	1.9	1.1
D	4.5	4.8	5.0	4.6

6 (e) (i) Describe how the RCS values for **device A** are different to the RCS values for **device B**.

.....

.....

.....

.....

(2 marks)

6 (e) (ii) The scientists recommended that a passive radar device fitted to a small boat should have:

- the largest possible RCS value
- an RCS value consistently above 2.0

Which **one** of the devices, **A**, **B**, **C** or **D**, would you recommend that someone fits to their boat?

.....

Give a reason for your answer.

.....

.....

(1 mark)

10

4.6.1.3 Reflection of waves (physics only)

Question 06

March 2011 | PHY1BP | Original Q2 | Legacy

QUESTION TWO

Electromagnetic radiation can be absorbed, reflected and transmitted.

Match words, **A**, **B**, **C** and **D**, with the numbers **1**–**4** in the sentences.

A infra red

B microwaves

C visible light

D X-rays

A mirror is designed to reflect . . . **1** . . . .

Mobile phone masts are designed to transmit . . . **2** . . . .

The metal surface inside an oven is designed to reflect . . . **3** . . . .

Lead-lined aprons used in hospitals are designed to absorb . . . **4** . . . .

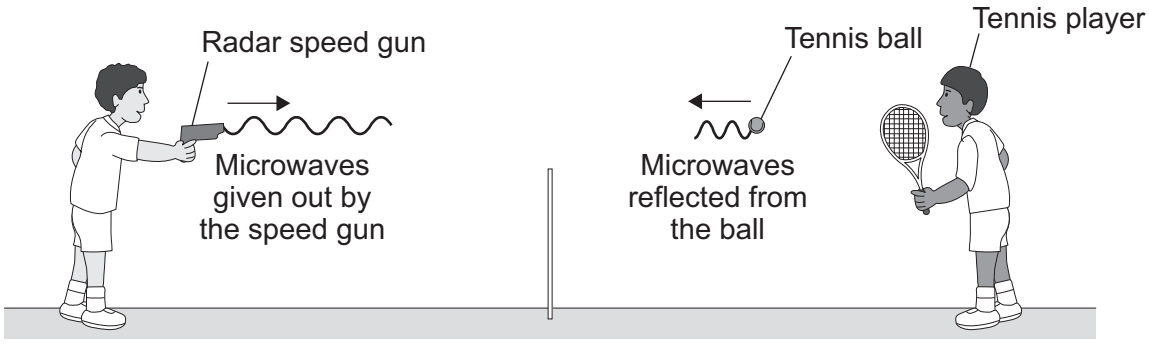
4.6.1.3 Reflection of waves (physics only)

Question 07

March 2011 | PHY1BP | Original Q8 | Legacy

QUESTION EIGHT

The picture shows a radar speed gun being used to measure how fast a tennis player hits the ball.



Some of the microwaves from the radar speed gun are absorbed by the ball and some are reflected by the ball.

8A What effect will the absorbed microwaves have on the ball?

1 The temperature of the ball will increase slightly.

2 The ball will go faster.

3 The temperature of the ball will decrease slightly.

4 The ball will go slower.

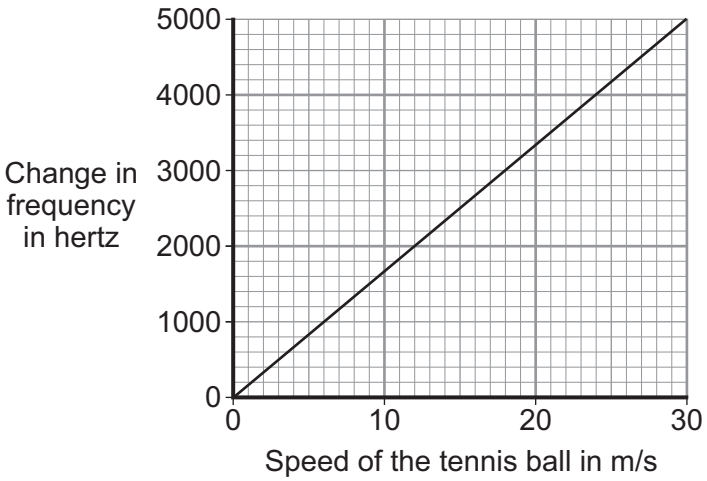
8B Which row in the table describes how the frequency and wavelength of the reflected microwaves are different from the microwaves given out by the speed gun?

	Frequency of reflected waves	Wavelength of reflected waves
1	higher	longer
2	lower	shorter
3	higher	shorter
4	lower	longer

4.6.1.3 Reflection of waves (physics only)

Question 07 · continued

The graph shows how the change in frequency of the microwaves depends on the speed of the ball.



8C The data has been drawn as a line graph because . . .

1 frequency and speed are both categoric variables.

2 frequency and speed are both continuous variables.

3 frequency is a categoric variable and speed is a continuous variable.

4 frequency is a continuous variable and speed is a categoric variable.

8D The speed gun measures the change in frequency as 3000 Hz.

What is the speed of the ball?

1 18 m/s

2 20 m/s

3 21 m/s

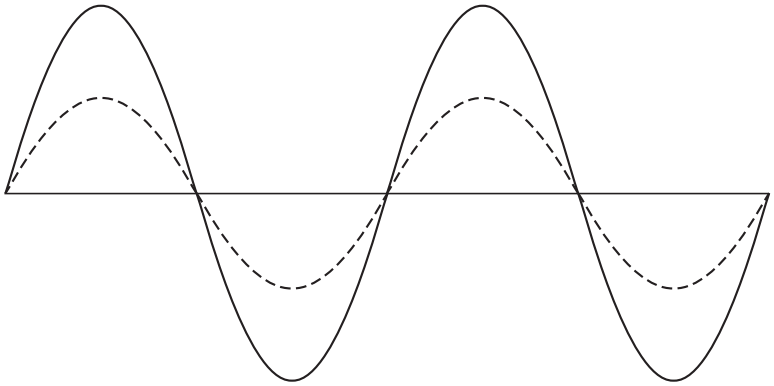
4 22 m/s

4.6.1.3 Reflection of waves (physics only)

Question 08

4 (a) **Diagram 1** shows two waves.

Diagram 1



4 (a) (i) Name **one** wave quantity that is the same for the two waves.

.....

(1 mark)

4 (a) (ii) Name **one** wave quantity that is different for the two waves.

.....

(1 mark)

4 (a) (iii) The waves in **Diagram 1** are transverse.

Which **one** of the following types of wave is **not** a transverse wave?

Draw a ring around the correct answer.

gamma rays **sound** **visible light**

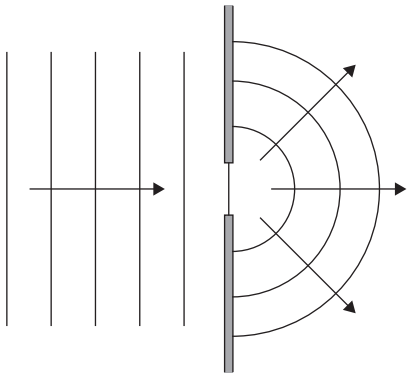
(1 mark)

4.6.1.3 Reflection of waves (physics only)

Question 08 · continued

4 (b) **Diagram 2** shows water waves in a ripple tank moving towards and passing through a gap in a barrier.

Diagram 2



4 (b) (i) The water waves spread out after passing through the gap in the barrier.

What name is given to the process causing the waves to spread out?

.....

(1 mark)

4 (b) (ii) Every second, 8 waves pass through the gap in the barrier. The waves have a wavelength of 0.015 metres.

Calculate the speed of the water waves and give the unit.

Use the correct equation from the Physics Equations Sheet.

.....

.....

.....

Speed = ...

(3 marks)

7

4.6.1.3 Reflection of waves (physics only)

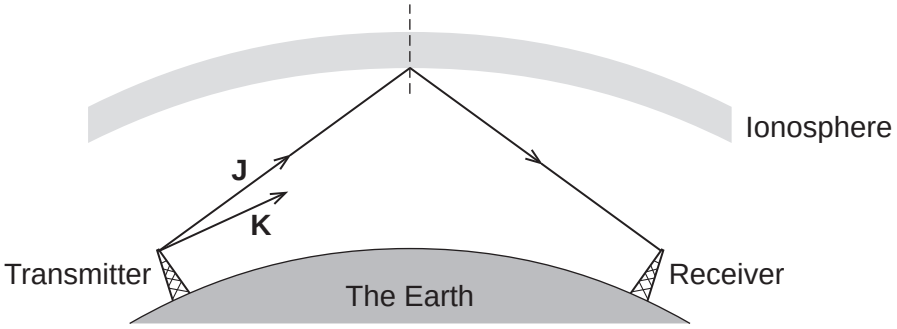
Question 09

June 2015 | PH1FP | Original Q1 | Legacy

1 Different parts of the electromagnetic spectrum are useful for different methods of communication.

1 (a) **Figure 1** shows a transmitter emitting two electromagnetic waves, **J** and **K**.

Figure 1



Wave **J** is reflected by a layer in the atmosphere called the ionosphere.

1 (a) (i) Wave **K** will also be reflected by the ionosphere.
On **Figure 1**, draw the path of wave **K** to show that it **does not** reach the receiver.

[2 marks]

1 (a) (ii) What is the name given to the dashed line in **Figure 1**?

[1 mark]

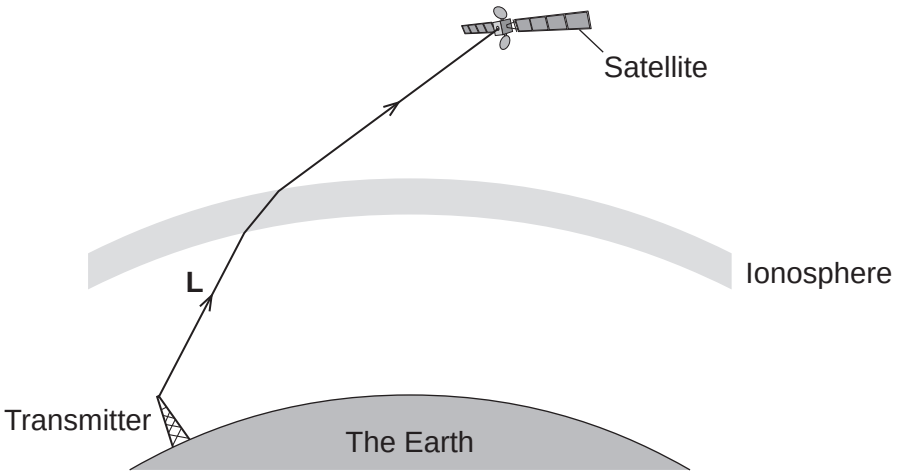
.....

4.6.1.3 Reflection of waves (physics only)

Question 09 · continued

1 (b) **Figure 2** shows a transmitter sending a signal to a satellite orbiting the Earth.

Figure 2



1 (b) (i) Which type of electromagnetic wave is used to send a signal to a satellite?

[1 mark]

Draw a ring around the correct answer.

gamma **microwave** **ultraviolet**

1 (b) (ii) What name is given to the process that occurs as wave **L** passes into the ionosphere?

[1 mark]

Draw a ring around the correct answer.

diffraction **reflection** **refraction**

Question 1 continues on the next page

4.6.1.3 Reflection of waves (physics only)

Question 09 · continued

1 (c) Waves **J**, **K** and **L** are electromagnetic waves.

What are **two** properties of **all** electromagnetic waves?

[2 marks]

Tick (✓) **two** boxes.

Property	Tick (✓)
All electromagnetic waves are longitudinal.	
All electromagnetic waves are transverse.	
All electromagnetic waves are mechanical.	
All electromagnetic waves have the same speed in a vacuum.	
All electromagnetic waves have the same frequency.	

7

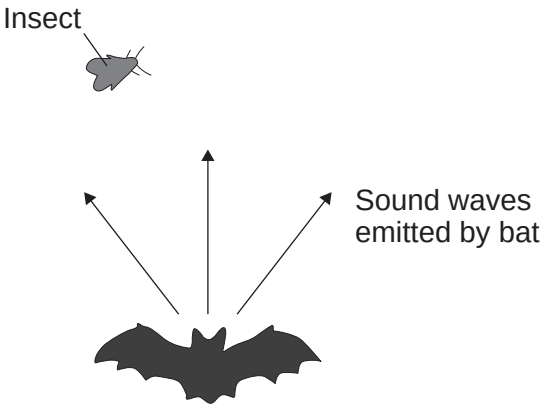
4.6.1.3 Reflection of waves (physics only)

Question 10

June 2016 | PH1FP | Original Q6 | Legacy

6 Bats use the reflection of high pitched sound waves to determine the position of objects. **Figure 10** shows a bat and an insect flying in front of the bat.

Figure 10



6 (a) What determines the pitch of a sound wave?

[1 mark]

Tick (✓) **one** box.

	Tick (✓)
amplitude	
frequency	
speed	

6 (b) State the name given to reflected sound waves.

[1 mark]

_____

4.6.1.3 Reflection of waves (physics only)

Question 10 · continued

6 (c) The bat emits sound waves with a range of wavelengths.

Some of the sound waves will be diffracted by the insect.

Complete the following sentences to explain why.

[2 marks]

Diffraction is caused by the sound waves _____ as they pass the insect.

The most diffraction happens when the wavelength of the sound wave is

_____ the size of the insect.

6 (d) The bat emits a sound wave with a frequency of 25.0 kHz and a wavelength of 0.0136 metres.

Calculate the speed of this sound wave.

Use the correct equation from the Physics Equations Sheet.

[2 marks]

_____

_____

_____

Speed = _____ m/s

6 (e) Sound waves are longitudinal. Describe a longitudinal sound wave.

[2 marks]

_____

_____

_____

_____

8

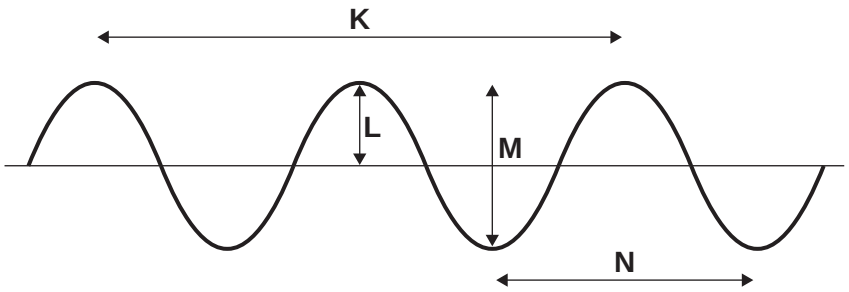
4.6.1.3 Reflection of waves (physics only)

Question 11

June 2017 | PH1FP | Original Q3 | Legacy

3 (a) **Figure 4** shows an electromagnetic wave.

Figure 4



3 (a) (i) Which arrow, **K**, **L**, **M** or **N**, shows the wavelength of the wave?

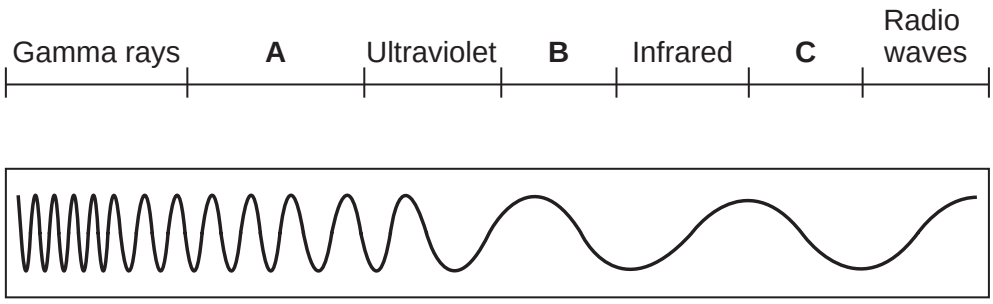
[1 mark]

3 (a) (ii) Which arrow, **K**, **L**, **M** or **N**, shows the amplitude of the wave?

[1 mark]

3 (b) **Figure 5** shows the electromagnetic spectrum.

Figure 5



A laser emits visible light.

Which letter, **A**, **B** or **C**, on **Figure 5** shows the position of visible light?

[1 mark]

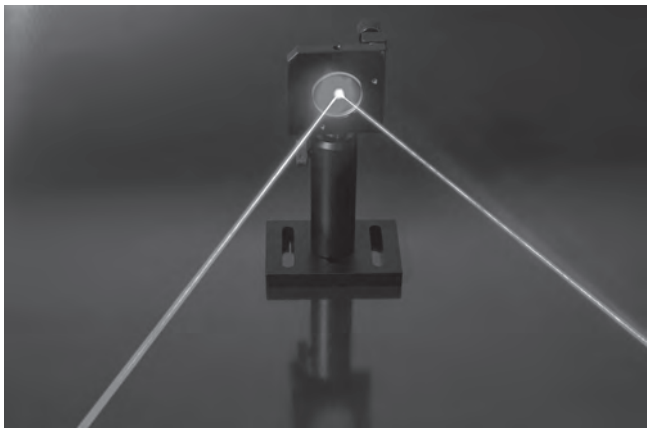
4.6.1.3 Reflection of waves (physics only)

Question 11 · continued

3 (c) Laser light is used in some burglar alarms.

Figure 6 shows laser light being reflected by a mirror. The light then reaches a detector.

Figure 6



3 (c) (i) How does the size of the angle of incidence compare with the size of the angle of reflection?

[1 mark]

_____

_____

3 (c) (ii) When a burglar gets in the way of the laser light, the light no longer reaches the detector.

Suggest **one** reason why.

[1 mark]

_____

_____

5

4.6.1.3 Reflection of waves (physics only)

Question 12

June 2017 | PH1FP | Original Q6 | Legacy

6 Starter pistols are used in athletics events to start races. A starter pistol makes a loud bang and produces a puff of smoke.

Figure 10 shows two people who investigated the speed of sound using a starter pistol and a stopclock.

Figure 10

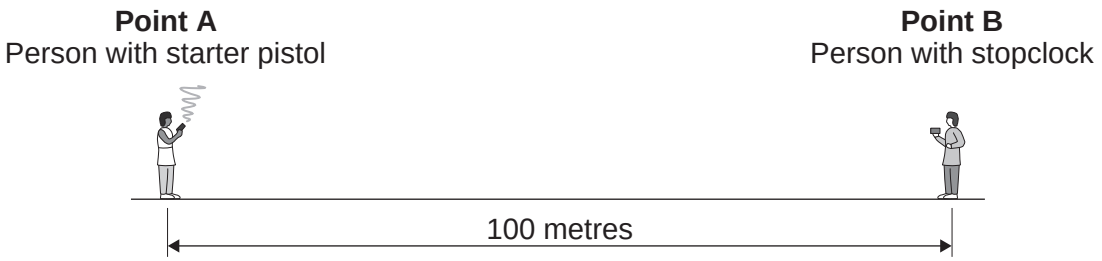


Figure 10 is not drawn to scale.

6 (a) The person at **Point B** sees the puff of smoke before hearing the bang from the starter pistol.

What does this tell you about the speed of sound compared with the speed of light?

[1 mark]

_____

_____

6 (b) The frequency of the sound wave produced by the pistol was 800 Hz

The wavelength of the sound wave was 0.42 m

Calculate the speed of the sound wave.

Use the correct equation from the Physics Equations Sheet.

Choose the correct unit.

m/s^2 m/s m^2/s

[3 marks]

_____

_____

_____

Speed = _____ unit _____

4.6.1.3 Reflection of waves (physics only)

Question 12 · continued

6 (c) Complete **Table 1** to show the properties of the sound wave at **Point B** compared with the sound wave at **Point A**.

[3 marks]

Tick (✓) **one** box for each property comparison.

Table 1

Properties of the sound wave at Point B compared to Point A	greater than	less than	the same as
amplitude			
frequency			
speed			

6 (d) A sound wave can be reflected. What name is given to a reflected sound wave?

[1 mark]

_____

6 (e) Which **two** of these statements are true for sound waves?

[2 marks]

Tick (✓) **two** properties.

	Tick (✓)
Sound waves can travel through a vacuum.	
Sound waves are transverse waves.	
Sound waves are longitudinal waves.	
Sound waves transfer energy.	
Sound waves are electromagnetic waves.	

10

4.6.1.3 Reflection of waves (physics only)

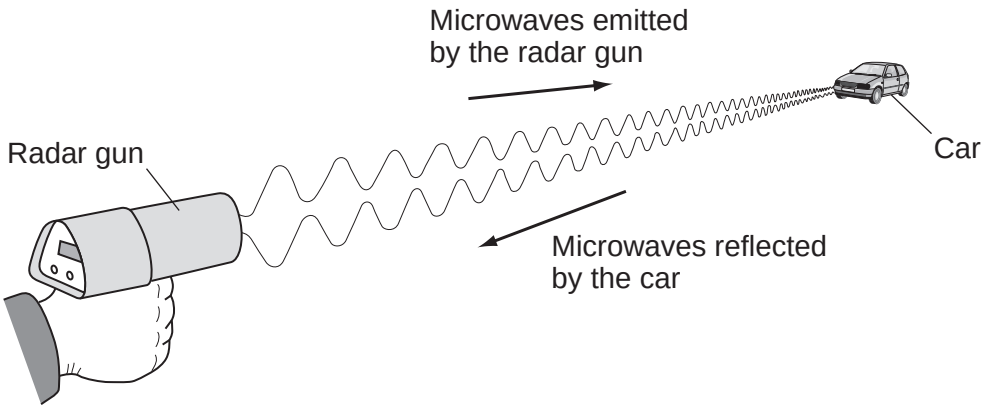
Question 13

June 2017 | PH1FP | Original Q8 | Legacy

8 A radar gun can be used to measure the speed of a car.

Microwaves are emitted by the radar gun and reflected by the car, as shown in **Figure 13**.

Figure 13



8 (a) The microwaves reflected by the moving car have a different frequency from the microwaves emitted by the radar gun.

What is the name of the effect causing this change in frequency?

[1 mark]

_____

8 (b) The data in **Table 3** are measurements taken from three different cars on the same piece of road.

Table 3

Car	Frequency of emitted microwaves in kHz	Frequency of reflected microwaves in kHz
A	27 000 000	27 000 002
B	27 000 000	27 000 000
C	27 000 000	26 999 997

4.6.1.3 Reflection of waves (physics only)

Question 13 · continued

8 (b) (i) State which car in **Table 3** is moving towards the radar gun. Give a reason for your answer.

[2 marks]

Car _____

Reason _____

_____

8 (b) (ii) State which car in **Table 3** is moving the fastest. Give a reason for your answer.

[2 marks]

Car _____

Reason _____

_____

5

Turn over for the next question

4.6.1.3 Reflection of waves (physics only)

Question 14

June 2017 | PH3FP | Original Q5 | Legacy

5 A student investigates how a lens forms an image of a light bulb.

The image is formed on a screen.

Figure 8 shows the apparatus used.

Figure 8



5 (a) (i) Name the process that occurs at the lens to make an image form on the screen.

[1 mark]

_____

5 (a) (ii) Use the correct answer from the box to complete the sentence.

[1 mark]

real	**upright**	**virtual**

Light arriving on the screen forms an image which is _____ .

5 (a) (iii) The student places an object 2.0 cm tall near to the lens. The image formed on the screen is 3.0 cm tall.

Calculate the magnification of the image.

Use the correct equation from the Physics Equations Sheet.

[2 marks]

_____

_____

Magnification = _____

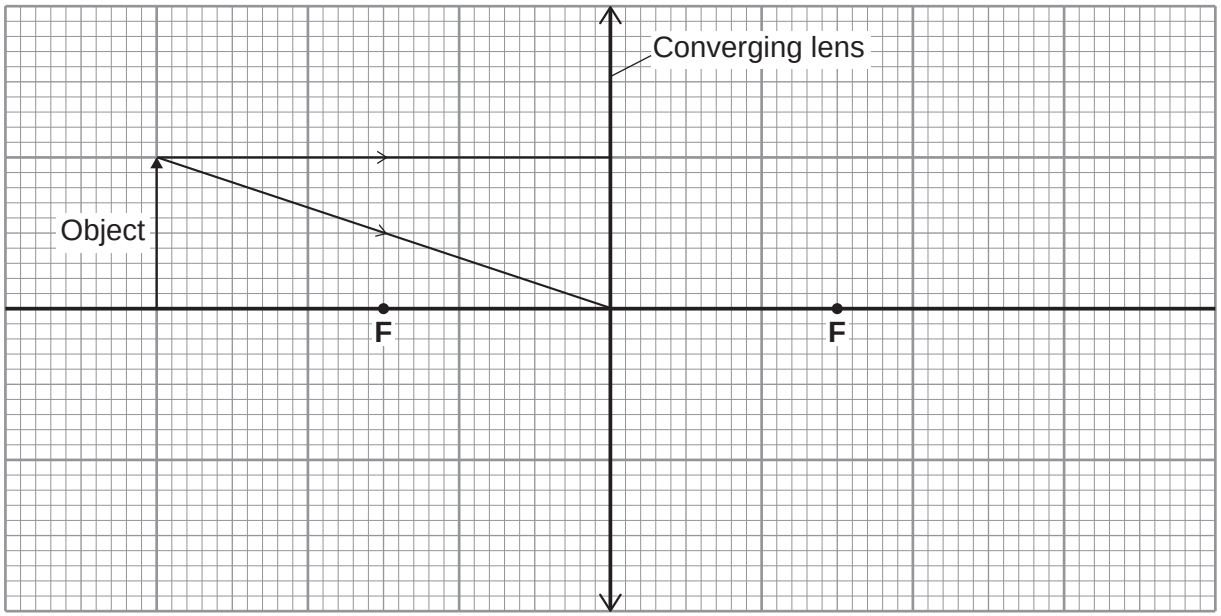
4.6.1.3 Reflection of waves (physics only)

Question 14 · continued

5 (b) **Figure 9** shows a ray diagram of a converging (convex) lens with an object.

The diagram shows two rays of light leaving the object and reaching the lens.

Figure 9



5 (b) (i) Complete **Figure 9** to show how these two rays form an image.

[2 marks]

5 (b) (ii) Mark the position of the image with an arrow.

[1 mark]

5 (b) (iii) State the name of the two points labelled **F** on **Figure 9**.

[1 mark]

Question 5 continues on the next page

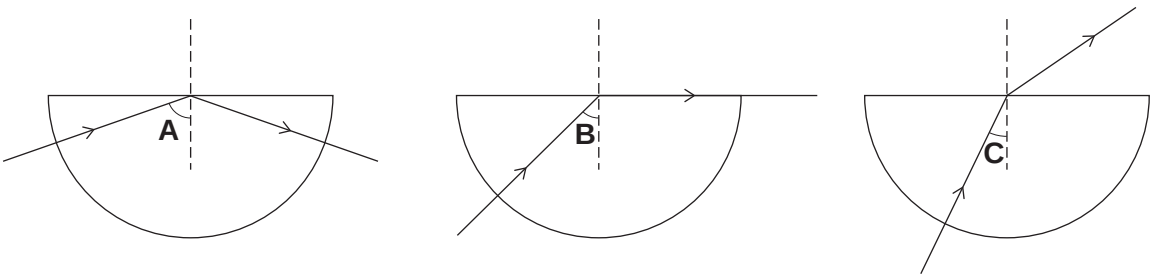
4.6.1.3 Reflection of waves (physics only)

Question 14 · continued

5 (c) Another student investigates how light travels in a semi-circular glass block.

The student shines a ray of light into a semi-circular glass block from three different directions as shown in **Figure 10**.

Figure 10



X **Y** **Z**

5 (c) (i) Which diagram, **X**, **Y** or **Z**, shows total internal reflection of the light?

[1 mark]

Diagram _____

5 (c) (ii) Which angle, **A**, **B** or **C**, is the critical angle of the light in the block?

[1 mark]

Angle _____

10

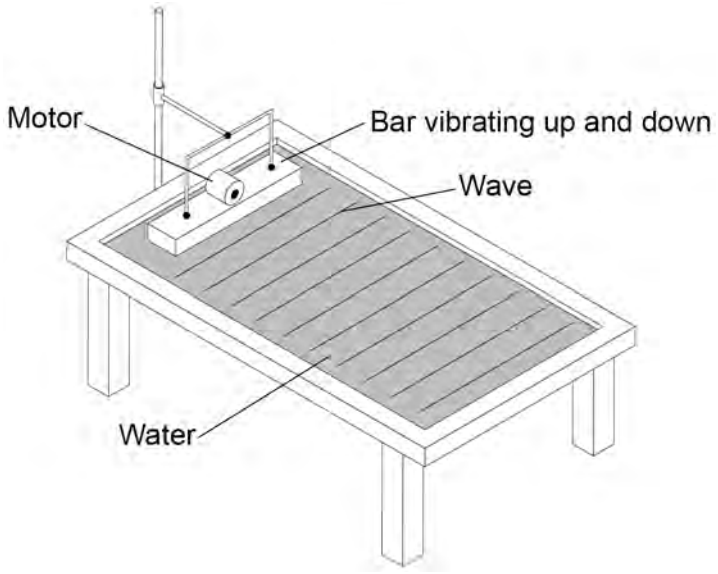
4.6.1.3 Reflection of waves (physics only)

Question 15

June 2018 | 8463/2F | Original Q3

0 3 **Figure 2** shows a ripple tank that a student used to investigate water waves.

Figure 2



0 3 . 1 The student adjusted the speed of the motor so that the bar hit the water more times each second.

What happened to the frequency of the waves produced?

Tick **one** box.

[1 mark]

Decreased ☐

Did not change ☐

Increased ☐

0 3 . 2 Describe how the frequency of the water waves in the ripple tank can be measured.

[2 marks]

4.6.1.3 Reflection of waves (physics only)

Question 15 · continued

June 2018 | 8463/2F | Original Q3

0 3 . 3 The student measured the frequency of the water waves as 5 hertz.

Calculate the period of the water waves.

Use the equation:

$$\text{period} = \frac{1}{\text{frequency}}$$

Choose the unit.

metres	**metres / second**	**seconds**

[3 marks]

Period = _____ Unit _____

6

4.6.1.3 Reflection of waves (physics only)

Question 16

June 2022 | 8463/2F | Original Q9

0 9 A student used a ray box to shine a ray of light through air into a glass block.

The student investigated how the angle of refraction varied with the angle of incidence.

Table 5 shows the results.

Table 5

Angle of incidence in degrees	Angle of refraction in degrees
10	5
20	10
30	14
40	19
50	23
60	26
70	28
80	29

0 9 . 1 Describe a method the student could have used to obtain the results in **Table 5**.

Your answer may include a labelled diagram.

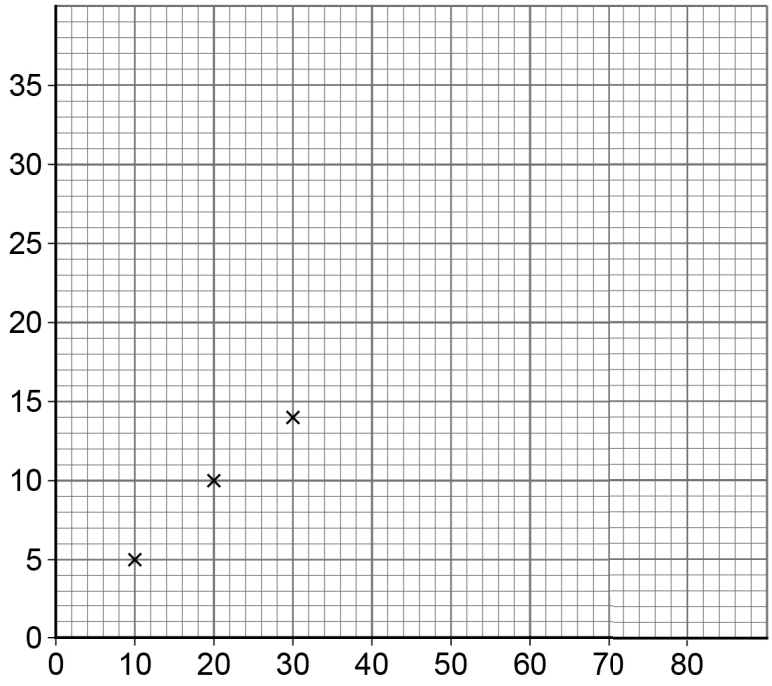
[6 marks]

4.6.1.3 Reflection of waves (physics only)

Question 16 · continued

0 9 . 2 **Figure 16** is an incomplete graph of the results.

Figure 16



Complete **Figure 16** using data from **Table 5**.

- Label the axes.
- Plot the remaining data.
- Draw a line of best fit.

[4 marks]

Question 9 continues on the next page

4.6.1.3 Reflection of waves (physics only)

Question 16 · continued

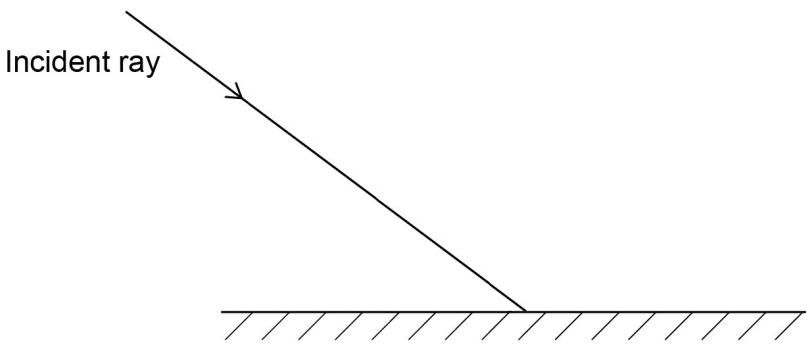
0 9 . 3 Complete the ray diagram in **Figure 17** to show the reflection of light from the surface of a plane mirror.

You should:

- draw the normal line
- draw the reflected ray.

[2 marks]

Figure 17



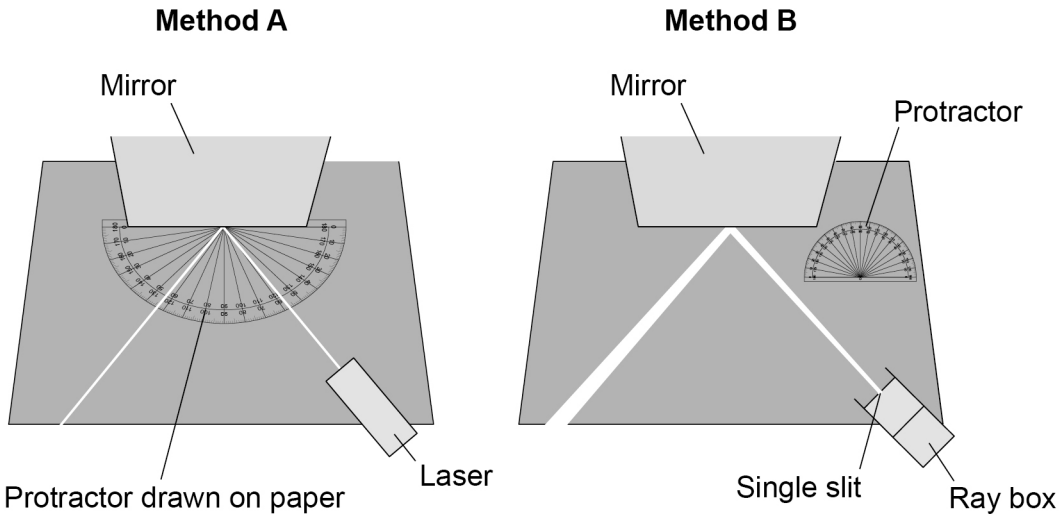
4.6.1.3 Reflection of waves (physics only)

Question 16 · continued

0 9 . 4 Two students investigated the reflection of light by a plane mirror.

Figure 18 shows the different equipment the students used.

Figure 18



Explain **two** ways that **Method A** is better than **Method B**.

[4 marks]

1 _____

_____

_____

_____

2 _____

_____

_____

_____

16

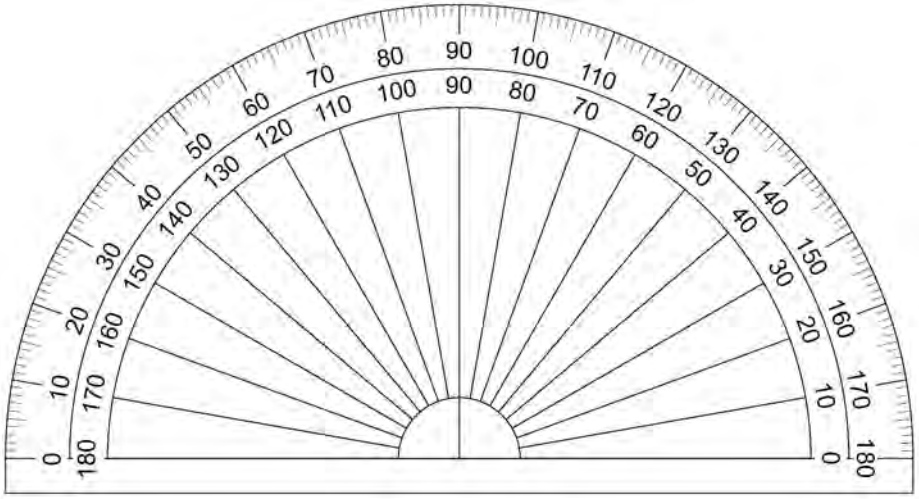
4.6.1.3 Reflection of waves (physics only)

Question 17

0 8 A student investigated the refraction of light by a glass block.

Figure 13 shows the protractor used to measure the angles of incidence and the angles of refraction.

Figure 13



0 8 . 1 What is the resolution of the protractor used to measure the angles?

[1 mark]

Resolution = _____ °

Table 1 shows the results.

Table 1

Angle of incidence in degrees	Angle of refraction in degrees
10	6
20	12
30	18
40	23
50	28
60	32

4.6.1.3 Reflection of waves (physics only)

Question 17 · continued

0 8 . 2 Describe a method the student could have used to obtain the data in **Table 1**.

You may include a labelled diagram.

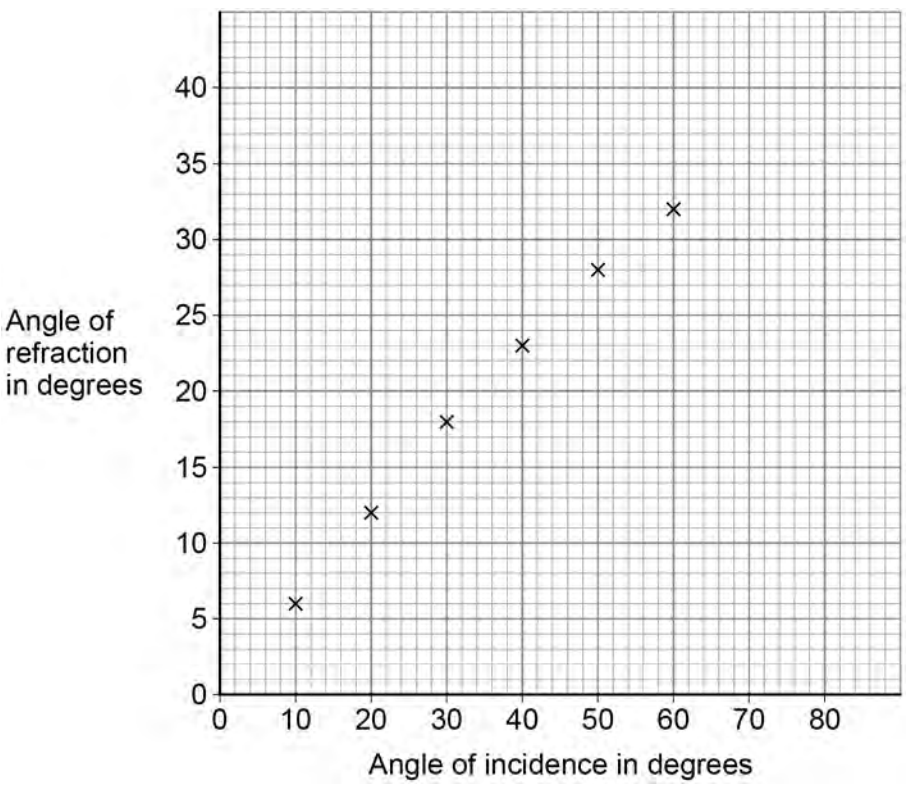
[6 marks]

4.6.1.3 Reflection of waves (physics only)

Question 17 · continued

Figure 14 shows some of the results.

Figure 14



The student measured the angles of refraction for two additional angles of incidence.

Table 2 shows the additional results.

Table 2

Angle of incidence in degrees	Angle of refraction in degrees
70	35
80	37

4.6.1.3 Reflection of waves (physics only)

Question 17 · continued

0 8 . 3 Complete **Figure 14**.

You should:

- plot the results from **Table 2**
- draw the line of best fit.

[2 marks]

0 8 . 4 How does **Figure 14** show that the angle of refraction is **not** directly proportional to the angle of incidence?

[1 mark]

Question 8 continues on the next page

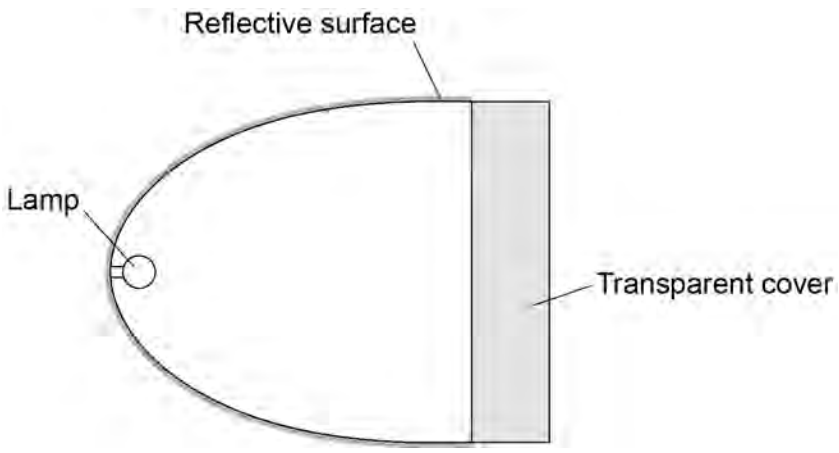
4.6.1.3 Reflection of waves (physics only)

Question 17 · continued

Figure 15 shows a diagram of a car headlight.

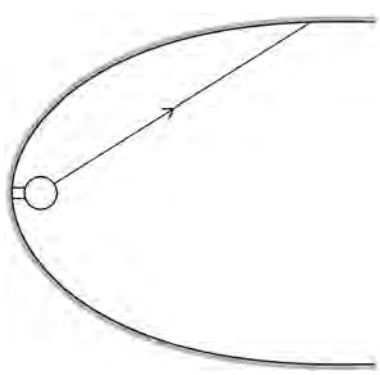
The headlight has a lamp, a reflective surface and a transparent cover.

Figure 15



0 8 . 5 **Figure 16** shows a ray of light incident on the reflective surface.

Figure 16



Complete **Figure 16** to show the reflected ray of light.

You should include the normal line at the point where the incident ray meets the reflecting surface.

[2 marks]

4.6.1.3 Reflection of waves (physics only)

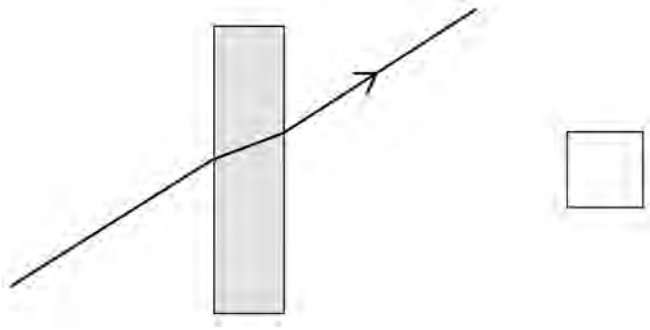
Question 17 · continued

0 8 . 6 Rays of light pass through the transparent cover of the headlight.

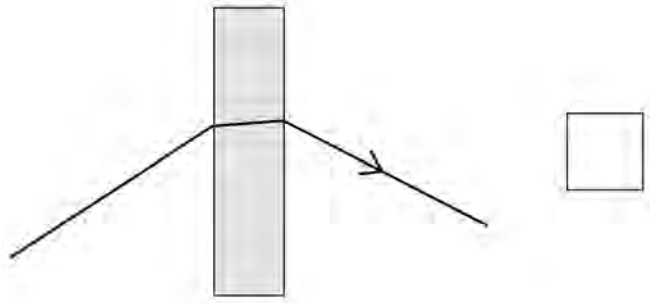
Which diagram shows how a ray of light passes through the transparent cover?

[1 mark]

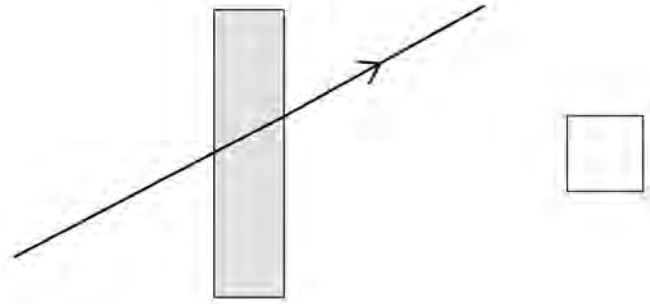
Tick (✓) **one** box.



☐



☐



☐

13

4.6.1.3 Reflection of waves (physics only)

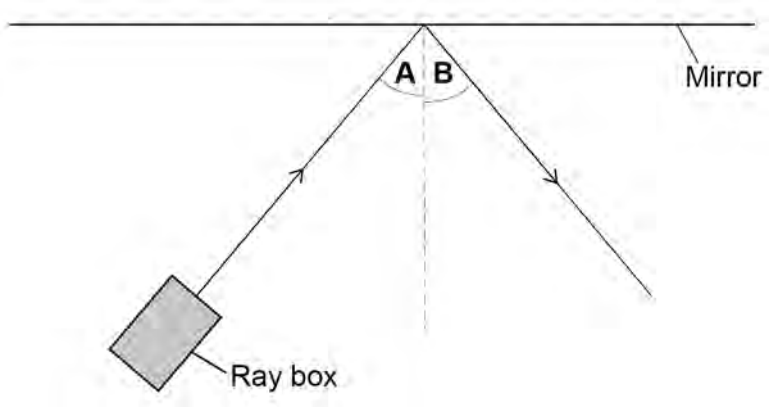
Question 18

0 1 Light waves and water waves can both be reflected.

A student used a ray box and a mirror to investigate the reflection of light.

Figure 1 shows some of the apparatus used.

Figure 1



0 1 . 1 The student measured angle **A** and angle **B**.

What equipment should the student have used to measure each angle?

[1 mark]

Question 1 continues on the next page

4.6.1.3 Reflection of waves (physics only)

Question 18 · continued

The student moved the ray box and changed the direction of the ray of light.

The student recorded different pairs of values of angle **A** and angle **B**.

Table 1 shows the results.

Table 1

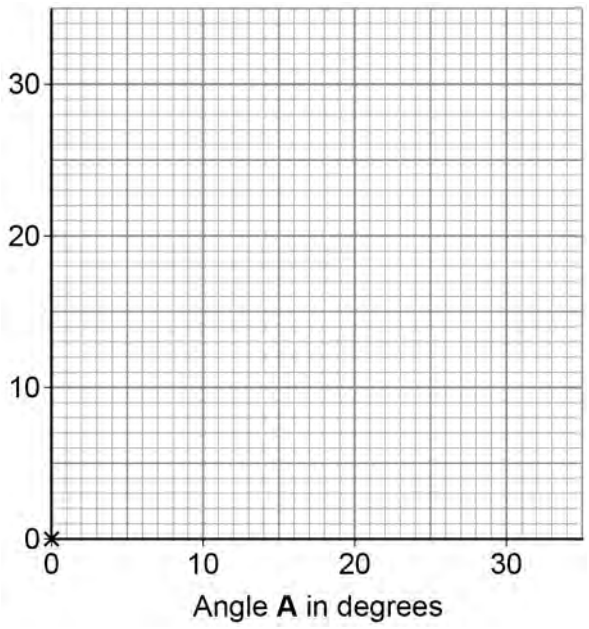
Angle A in degrees	Angle B in degrees
0	0
5	5
11	11
20	20
29	29

4.6.1.3 Reflection of waves (physics only)

Question 18 · continued

0 1 . 2 **Figure 2** shows an incomplete graph of the results.

Figure 2



Complete **Figure 2**.

You should:

- label the *y*-axis
- plot the remaining data from **Table 1**
- draw a line of best fit.

[4 marks]

0 1 . 3 What is the relationship between angle **A** and angle **B**?

[1 mark]

Tick (✓) **one** box.

Angle **A** is directly proportional to angle **B**. ☐

There is a negative correlation between angle **A** and angle **B**. ☐

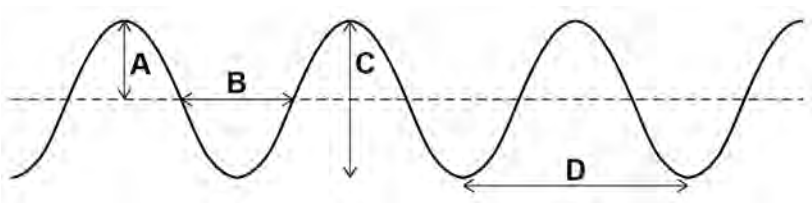
The relationship between angle **A** and angle **B** is non-linear. ☐

4.6.1.3 Reflection of waves (physics only)

Question 18 · continued

Figure 3 represents a water wave.

Figure 3



0 1 . 4 Which letter represents the amplitude of the water wave in **Figure 3**?

[1 mark]

Tick (✓) **one** box.

A ☐ **B** ☐ **C** ☐ **D** ☐

0 1 . 5 Which letter represents the wavelength of the water wave in **Figure 3**?

[1 mark]

Tick (✓) **one** box.

A ☐ **B** ☐ **C** ☐ **D** ☐

4.6.1.3 Reflection of waves (physics only)

Question 18 · continued

0 1 . 6 A water wave in a ripple tank has a wave speed of 0.125 m/s.

The wave has a frequency of 2.5 Hz.

Calculate the wavelength of the wave.

Use the equation:

$$\text{wavelength} = \frac{\text{wave speed}}{\text{frequency}}$$

Choose the unit from the box.

[3 marks]

m	Pa	kg / m

Wavelength = _____ Unit _____

0 1 . 7 The wave has a frequency of 2.5 Hz.

Calculate the period of the wave.

Use the equation:

$$\text{period} = \frac{1}{\text{frequency}}$$

[2 marks]

Period = _____ s

13