Cambridge Assessment International Education

Cambridge IGCSE™

1: Light – Topic questions

Paper 3

The questions in this document have been compiled from a number of past papers, as indicated in the table below.

Use these questions to formatively assess your learners' understanding of this topic.

Question	Year	Series	Paper number
8	2016	June	31
6	2016	March	32
5	2016	November	31

The mark scheme for each question is provided at the end of the document.

You can find the complete question papers and the complete mark schemes (with additional notes where available) on the School Support Hub at www.cambridgeinternational.org/support

8 A student directs a ray of light towards a plane mirror, as shown in Fig. 8.1.

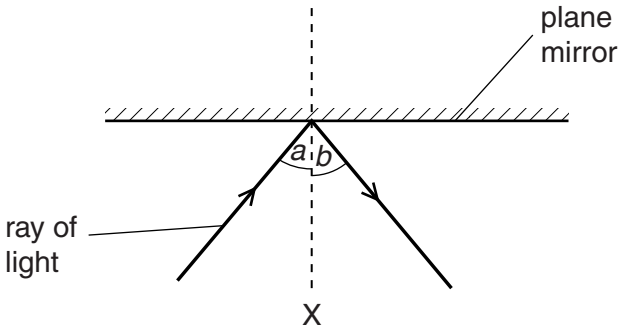

Fig. 8.1

(a) (i) Name the line labelled X.

.....[1]

(ii) When angle *a* is 45°, angle *b* is also 45°.

Angle *a* is changed to 20°.

What is the new value of angle *b*? Tick **one** box.

20° ☐ 25° ☐ 45° ☐ 65° ☐ 80° ☐

[1]

(b) The student now makes the ray of light from Fig. 8.1 pass into a glass block, as shown in Fig. 8.2.

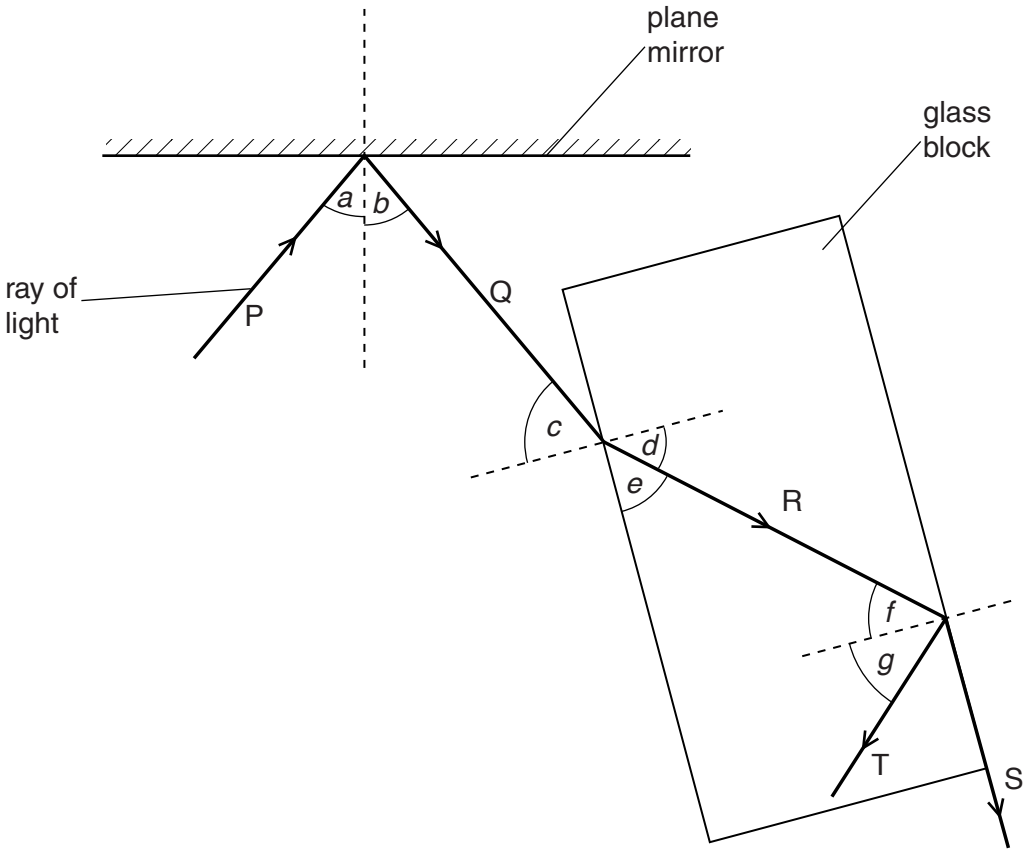

Fig. 8.2

Complete the table, using the labels from Fig. 8.2. The first label is done for you.

description	label
an angle of incidence	*a*
an angle of refraction	
an internally reflected angle	
a critical angle	
a refracted ray	

[4]

(c) The student uses a converging lens to produce an image of an object. Fig. 8.3 shows the arrangement.

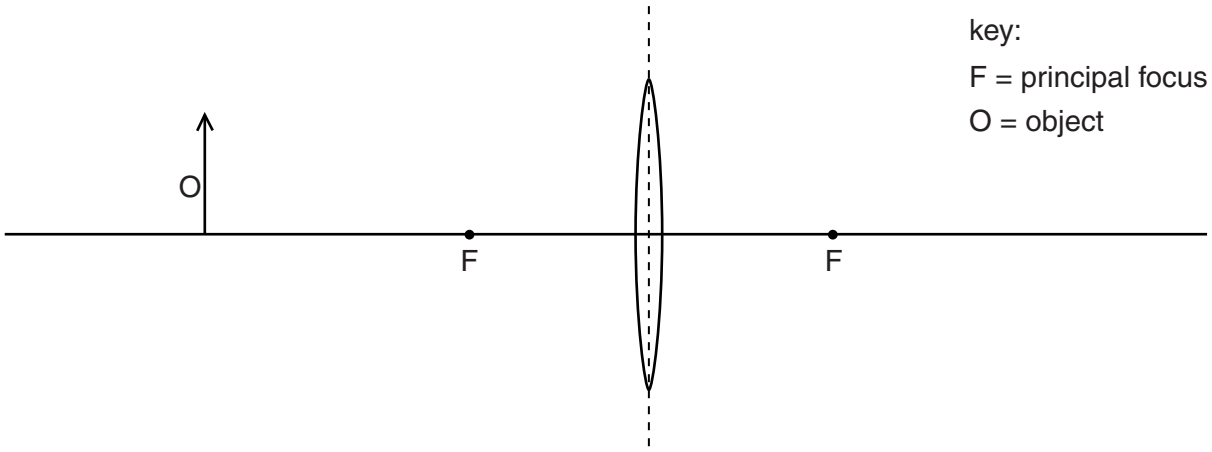

Fig. 8.3

On Fig. 8.3, using a ruler, carefully draw two rays from the object O to locate the position of the image. Use an arrow to represent the image. [3]

[Total: 9]

6 **(a)** Fig. 6.1 shows a plane mirror reflecting a ray of light.

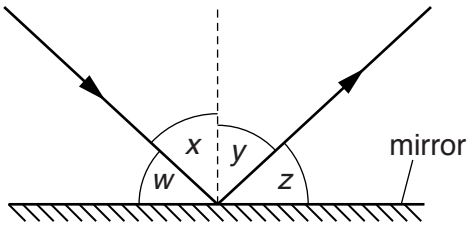

Fig. 6.1

(i) There is a dashed line drawn at right angles to the mirror.

State the name of this line.

.....[1]

(ii) State which angle, *w*, *x*, *y*, or *z*, is the angle of reflection.

.....[1]

(b) Fig. 6.2 shows a ray of white light entering a semi-circular glass block. The ray of light emerges at point R and travels alongside the flat surface.

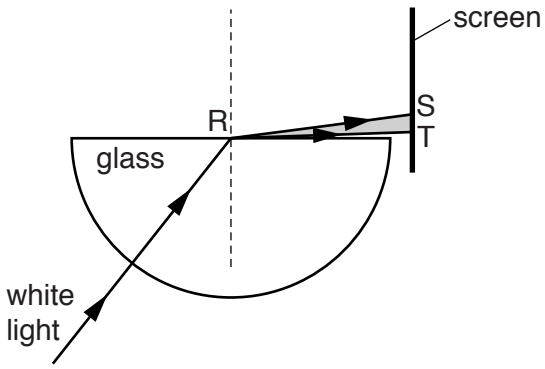

Fig. 6.2

A spectrum of colours can be seen on the screen between S and T.

(i) State the colours in the correct order. One has been done for you.

colour at S ..... red .....

.....

.....

.....

.....

.....

colour at T .....

[1]

(ii) The angle of the ray is changed.

On Fig. 6.3, complete the path of the ray of light. Explain your answer.

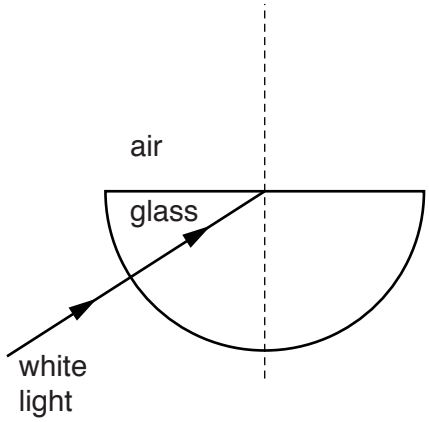

Fig. 6.3

.....

.....

.....[3]

[Total: 6]

5 **(a)** Fig. 5.1 shows a ray of red light passing through a semi-circular glass block.

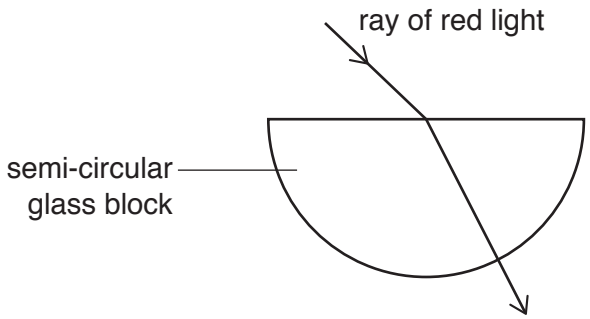

Fig. 5.1

(i) The ray of light changes direction as it travels into the block.

State the name that is given to this change of direction.

.....[1]

(ii) Fig. 5.2 shows another ray of red light travelling into the semi-circular glass block. It meets the curved surface at 90°.

Inside the block, the ray meets the flat surface of the block at an angle greater than the critical angle.

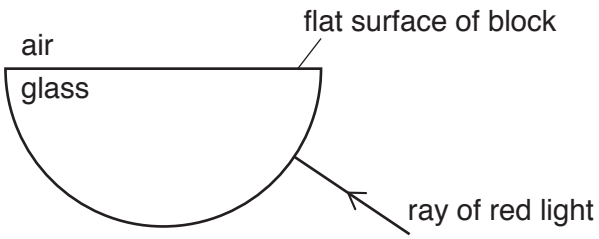

Fig. 5.2

On Fig. 5.2, complete the path of the ray of red light. [2]

(b) Fig. 5.3 shows the view from above of a car approaching an observer, marked with a cross **(×)**.

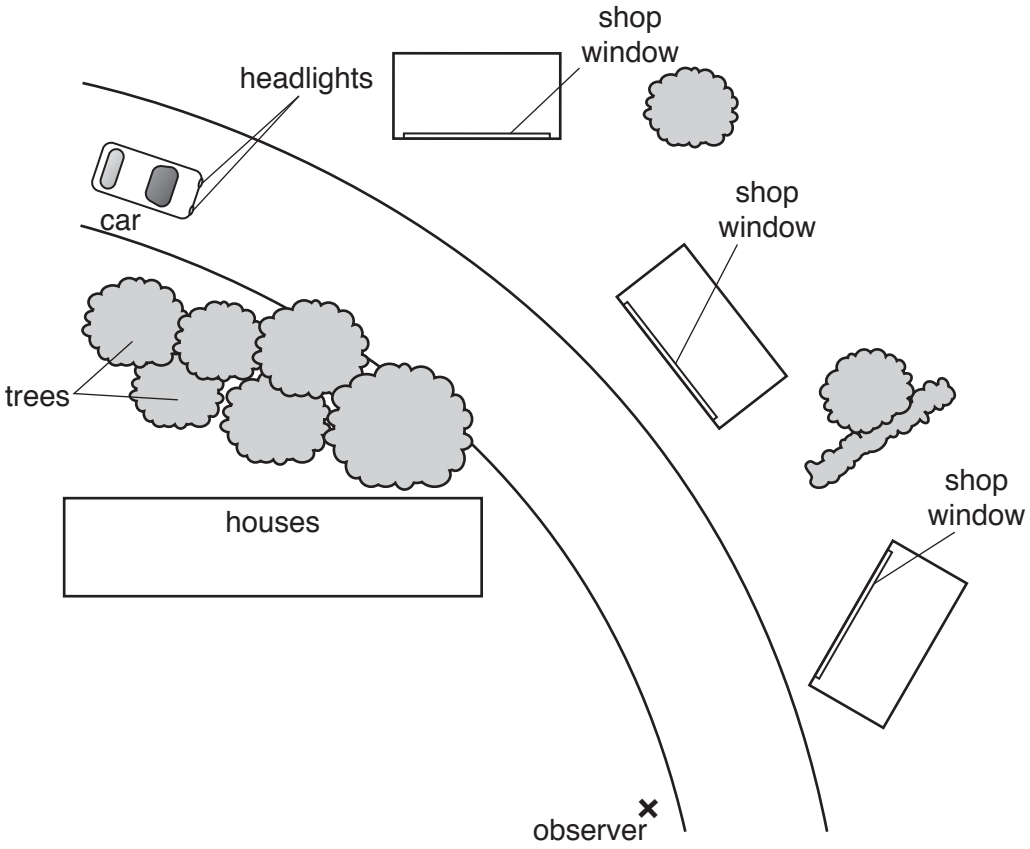

Fig. 5.3

(i) The observer sees the car's headlights reflected in one of the shop windows. The car's headlights are labelled.

In which shop window does the observer see the reflection? Show your answer by drawing, on Fig. 5.3, the path of a ray of light from a headlight to the observer. Use a ruler. [1]

(ii) State the law that you used to answer **(b)(i)**.

.....[1]

(iii) Add labels to Fig. 5.3 to show how the law stated in **(b)(ii)** applies. [2]

[Total: 7]

Question	Answer	Mark
8 (a) (i)	normal	B1
8 (a) (ii)	20°	B1
8 (b)	d g f R **OR** S	B1 B1 B1 B1
8 (c)	any two rays correctly drawn from top of O: ray parallel to axis, through lens, and beyond F ray undeviated through centre of lens and beyond ray through F, through lens, then parallel to axis inverted image correctly drawn and positioned at intersection of two rays	M2 A1
		Total: 9
6 (a) (i)	(the) normal	B1
6 (a) (ii)	y	B1
6 (b) (i)	(red), orange, yellow, green, blue, indigo, violet/purple	B1
6 (b) (ii)	any three from: (ON DIAGRAM) ray reflected angle i = angle r (by eye) explanation: (incident angle) is greater than critical angle (so there is) total internal reflection	B3
		Total: 6
5 (a) (i)	refraction	B1
5 (a) (ii)	ray travels un-deviated through curved surface ray reflected with i = r by eye	B1 B1
5 (b) (i)	ray drawn from headlight to hit middle shop and reflected towards X	B1
5 (b) (ii)	angle of reflection = angle of incidence	B1
5 (b) (iii)	normal drawn at point of incidence on window angles of incidence and reflection correctly labelled	B1 B1
		Total: 7

Notes about the mark scheme are available separately.