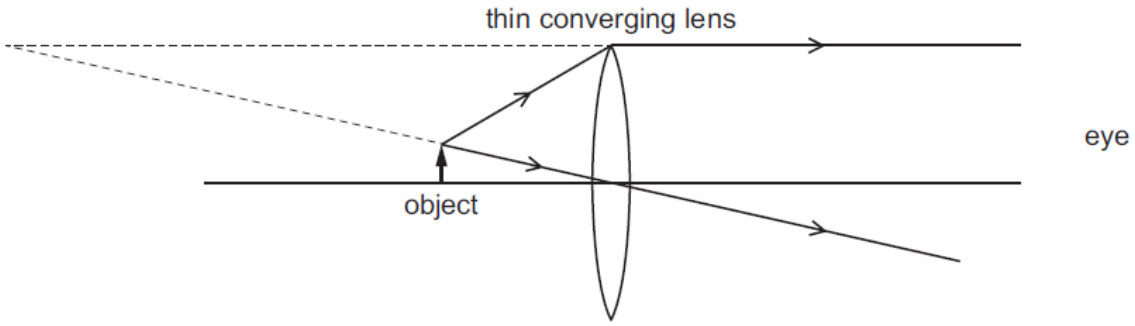
Light – 2022 June O Level 5054

1. June/2022/Paper_11/No.21

An object is viewed through a thin converging lens.

The diagram shows the paths of two rays from the top of the object to an eye.



How does the image compare with the object?

A It is larger and inverted.

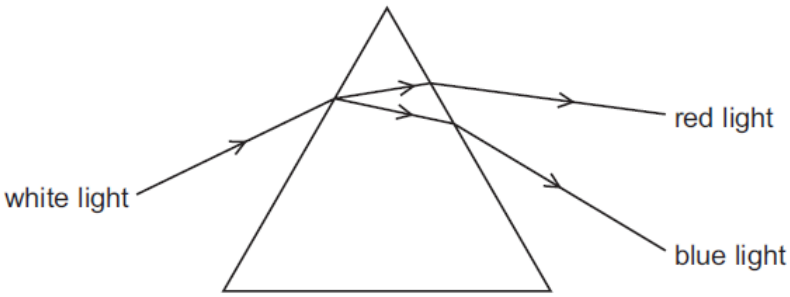
B It is larger and upright.

C It is smaller and inverted.

D It is smaller and upright.

2. June/2022/Paper_11/No.22

A ray of white light enters a prism as shown.

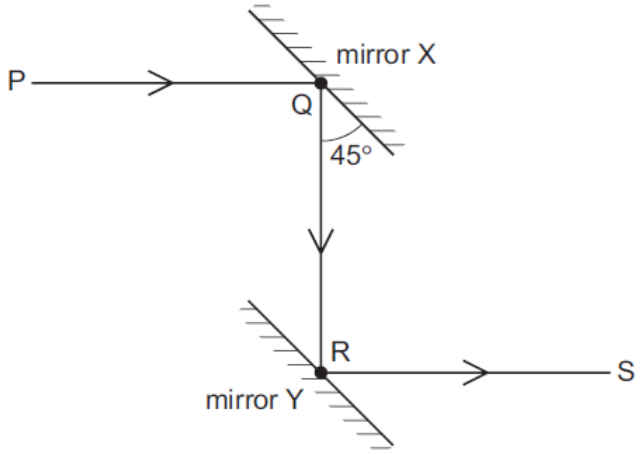


Which row is correct?

	wave properties observed	frequency of red light compared with frequency of blue light
A	dispersion only	smaller
B	refraction only	greater
C	dispersion and refraction	smaller
D	dispersion and refraction	greater

3. June/2022/Paper_12/No.24

The diagram shows a ray PQ reflected by mirror X to a parallel mirror Y. The reflected ray along RS is parallel to PQ.



Which statement is correct?

A The angle between PQ and QR is 45°.

B The angle between QR and RS is 180°.

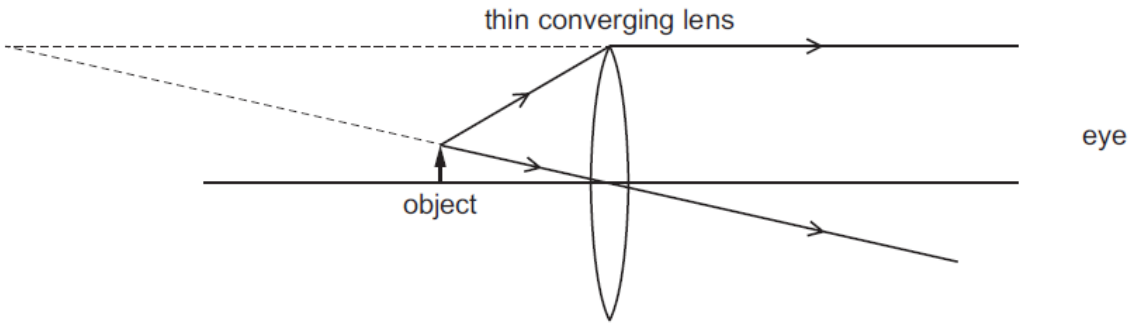
C The angle of incidence of PQ on mirror X is 60°.

D The angle of incidence of QR on mirror Y is 45°.

4. June/2022/Paper_12/No.25

An object is viewed through a thin converging lens.

The diagram shows the paths of two rays from the top of the object to an eye.



How does the image compare with the object?

A It is larger and inverted.

B It is larger and upright.

C It is smaller and inverted.

D It is smaller and upright.

5. June/2022/Paper_12/No.26

Violet and indigo light have the shortest wavelengths in the spectrum of visible light.

Which three colours, in order of increasing wavelength, immediately follow indigo?

A blue → green → orange

B blue → green → yellow

C green → blue → yellow

D yellow → green → orange

6. June/2022/Paper_21/No.4

Two parallel rays of light, one red and one blue, enter a glass prism.

Fig. 4.1 shows both rays of light before they enter the prism. The blue ray is also shown incident on a different side of the prism after passing through the prism.

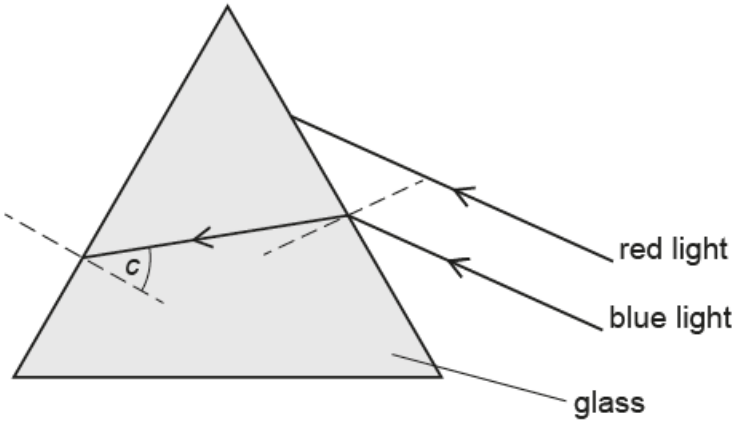


Fig. 4.1 (not to scale)

The ray of blue light strikes the left side of the prism at an angle equal to its critical angle *c*.

(a) (i) On Fig. 4.1, mark and label the angle of incidence *i* and the angle of refraction *r* for the blue light as it enters the prism. [1]

(ii) On Fig. 4.1, continue the path of the blue light after it strikes the left side of the prism. [1]

(iii) The refractive index of glass for red light is smaller than the refractive index for blue light.

On Fig. 4.1, draw the path of the red light as it travels in the prism and after it strikes the left side of the prism. [2]

(b) (i) State what is meant by the critical angle.

.....

..... [2]

(ii) The refractive index of glass for blue light is 1.5.

Calculate the critical angle *c* for blue light in glass. Show your working.

c = ... [2]

[Total: 8]

7. June/2022/Paper_22/No.4

Fig. 4.1 shows a ray of white light incident on a glass prism.

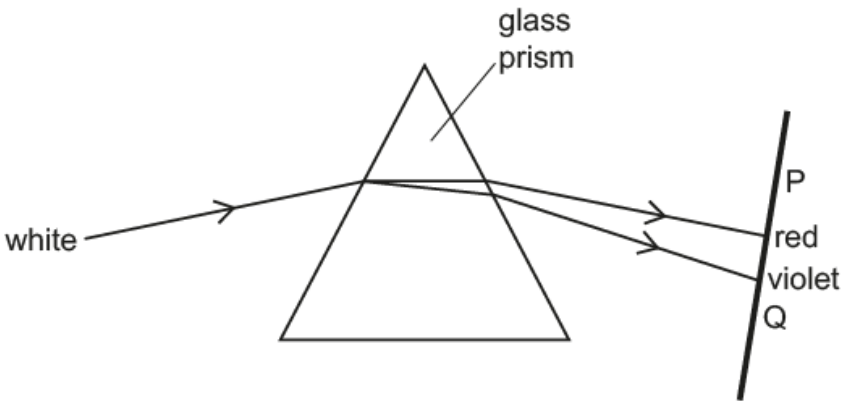


Fig. 4.1 (not to scale)

Refraction causes the white light to separate into different colours.

(a) Define the term 'angle of refraction'.

.....

..... [2]

(b) The angle of incidence of the white light as it enters the prism is 40° and the angle of refraction for the red light is 25°.

Calculate the refractive index of the glass for red light. Show your working.

refractive index = ... [2]

(c) Using Fig. 4.1, state and explain how the refractive index for red light differs from the refractive index for violet light.

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.....

.....

..... [2]

(d) The source of white light used in Fig. 4.1 produces other types of electromagnetic radiation as well as visible light.

State the name of the invisible radiation found at P and the invisible radiation found at Q.

at P ..... at Q ..... [1]

[Total: 7]