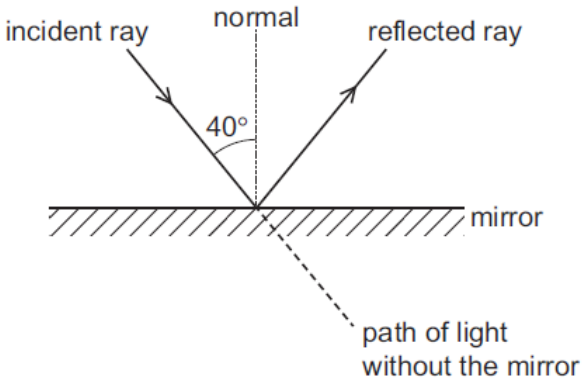
Light – 2022 Nov O Level 5054

1. Nov/2022/Paper_11,12/No.24,22

A mirror is placed in the path of a ray of light.

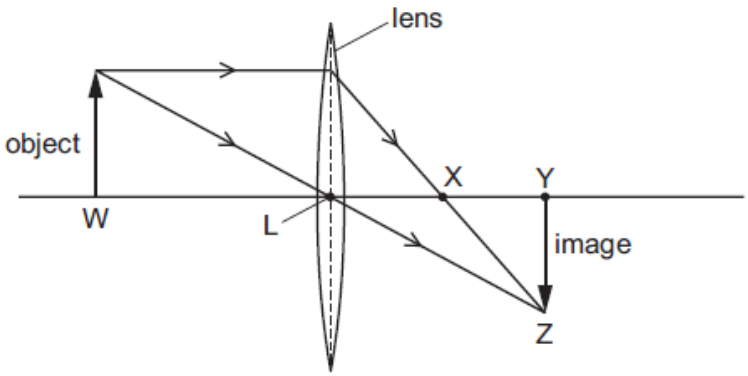


Through which angle does the direction of the ray of light change?

A 40° **B** 90° **C** 100° **D** 140°

2. Nov/2022/Paper_12/No.24

A thin converging lens forms a real, focused image of an object, as shown.

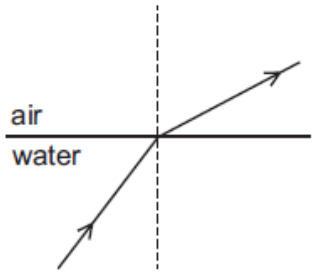


Which distance is equal to the focal length of the lens?

A LW **B** LX **C** LY **D** LZ

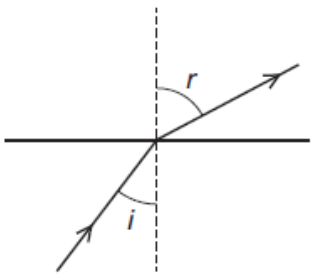
3. Nov/2022/Paper_12/No.23

A ray of light in water is refracted at the surface into air.

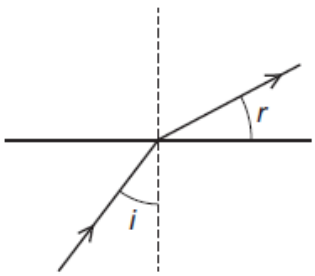


Which diagram shows the angle of incidence *i* and the angle of refraction *r*?

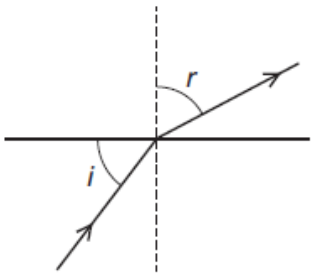
A



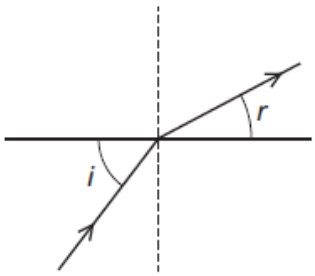
B



C



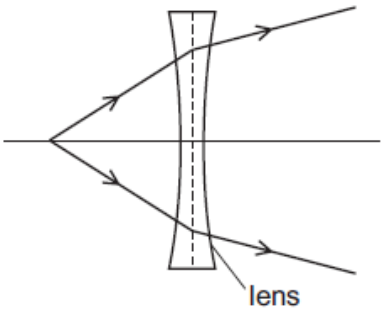
D



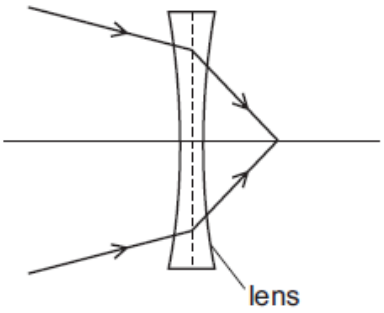
4. Nov/2022/Paper_12/No.25

Which ray diagram shows the action of a diverging lens?

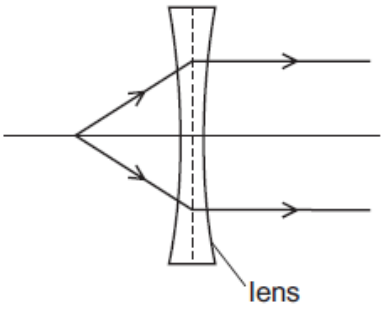
A



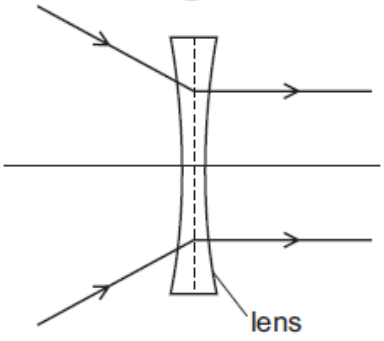
B



C



D



5. Nov/2022/Paper_21/No.8

A parallel beam of light travelling in air is incident on a glass lens.

The beam is perpendicular to the lens as shown in Fig. 8.1.

The dashed line P indicates the position of the lens. The centre of the lens is dot C.

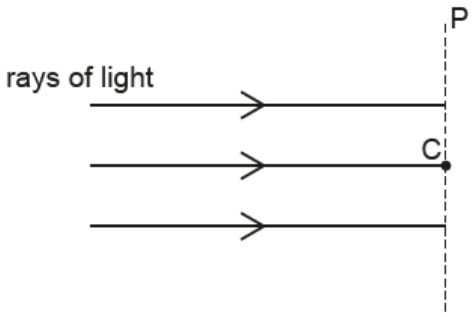


Fig. 8.1

(a) The lens is a diverging lens.

On Fig. 8.1:

(i) indicate the shape of the lens by drawing the outline of the lens around dashed line P [1]

(ii) draw the path taken by each ray of light after it passes through the lens. [2]

(b) Diverging lenses are used to correct short-sight.

(i) Fig. 8.2 is a simplified diagram of a short-sighted eye. Light from a distant object strikes the eye lens and enters the eye.

On Fig. 8.2, continue the three rays in the eye until they reach the back of the eye.

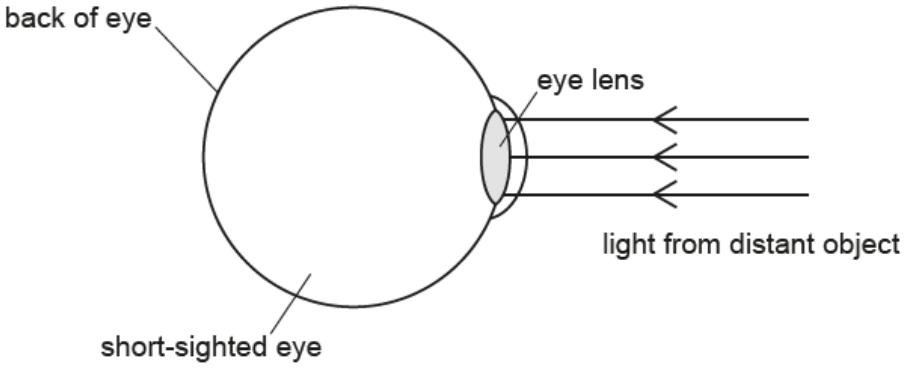


Fig. 8.2

[2]

(ii) State how the image of a distant object detected by a normal eye differs from the image detected by the short-sighted eye.

.....

..... [1]

(iii) Explain how a diverging lens corrects the sight of a short-sighted eye viewing a distant object.

.....

..... [1]

(c) The focal length of the diverging lens is 4.0 cm.

An object of height 3.5 cm is placed 6.0 cm from the centre of the lens.

(i) Fig. 8.3 is a full-scale diagram drawn on a grid, on which the dashed line L represents the lens and the arrow O the object.

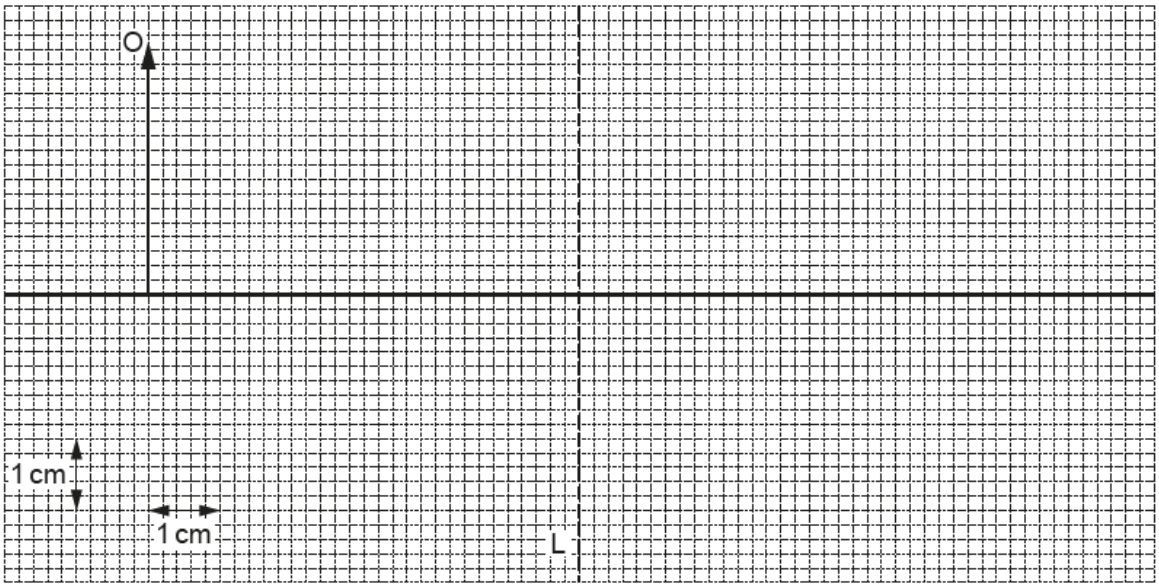


Fig. 8.3

By drawing on Fig. 8.3, find the position of the image I of object O. Draw image I and label it I. [4]

(ii) Explain whether the image produced is real or virtual.

.....

..... [1]

(iii) On the grid in Fig. 8.3, write an E in a position from which an eye can see the image. [1]

(iv) Determine the linear magnification produced.

linear magnification = ... [2]

[Total: 15]