

Eduqas Physics GCSE
Topic 6.3: Lenses
Questions by topic

1.

(a) Fig. 7.1 represents an object O placed in front of a converging lens.

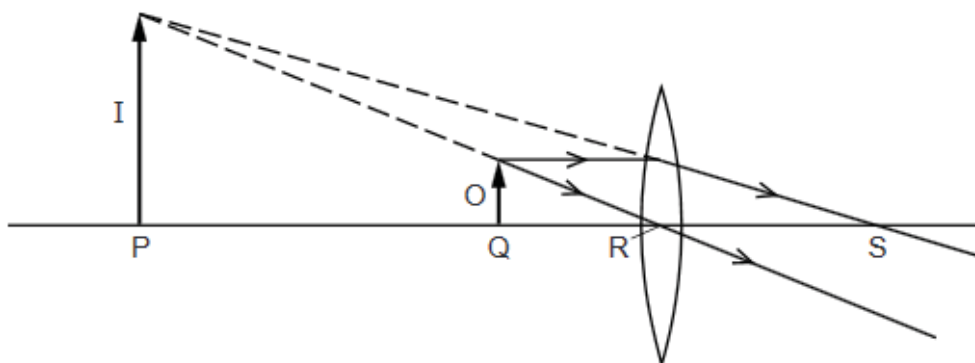


Fig. 7.1

(i) State a full description of the image I.

..... [2]

(ii) Using the letters on Fig. 7.1, identify the focal length of the lens.

..... [1]

(iii) On Fig. 7.1, draw an eye suitably placed to view the image I.

[1]

(b) Fig. 7.2 shows an object O placed to the left of a converging lens. A principal focus of the lens is at the position marked F.

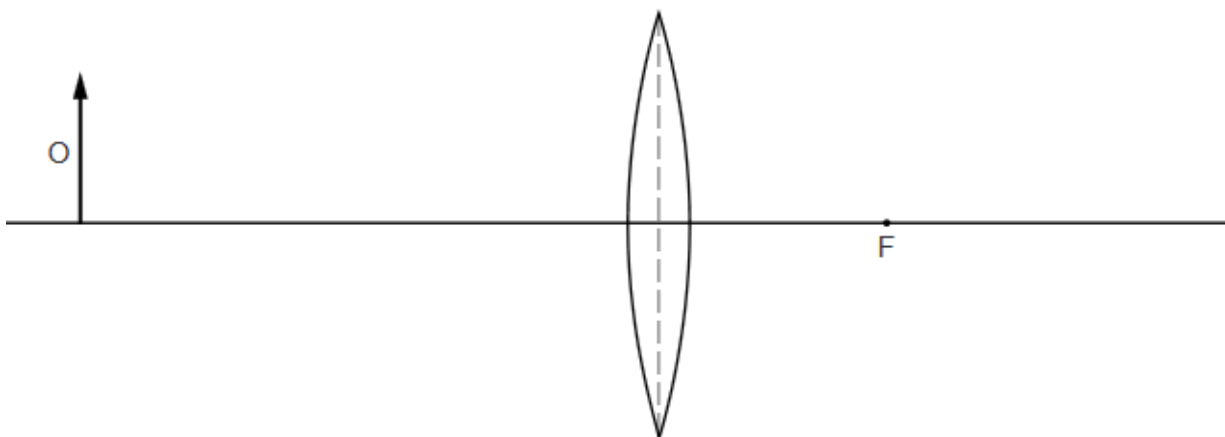


Fig. 7.2

(i) On Fig. 7.2, draw two rays to locate the image of object O. Draw the image.

(ii) On Fig. 7.2, draw one other ray from the upper tip of O to the image.

[4]

[Total: 8]

2.

A glass, converging lens is used as a magnifying glass to observe a red ant.

(a) Fig. 6.1 shows the lens, the principal axis, and the two principal focuses F_1 and F_2 .

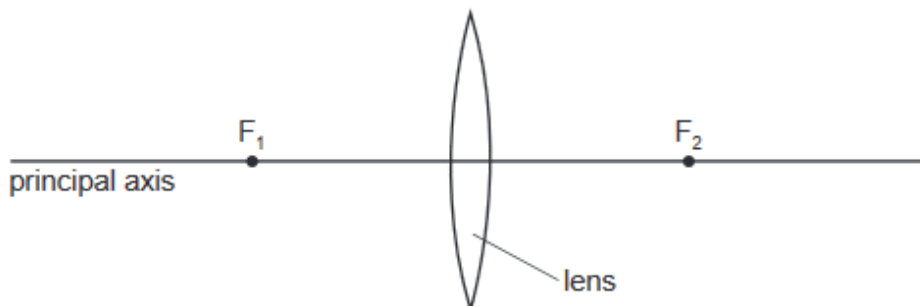


Fig. 6.1

- (i) 1. On Fig. 6.1, mark a point on the principal axis, labelled A, to indicate a suitable position for the ant.
2. On Fig. 6.1, mark a point on the principal axis, labelled E, to indicate a suitable position for the observer's eye.

[1]

(ii) Tick **one** of the boxes to indicate where, on the principal axis, the image of the ant is located.

- to the left of F_1
 between F_1 and the lens
 within the lens
 between the lens and F_2
 to the right of F_2

[1]

(iii) Underline **two** words in the list that describe the image produced by the magnifying glass.

diminished **inverted** **real** **upright** **virtual**

[2]

(b) (i) The red light from the ant passes into the lens.

As the light enters the lens, state what happens to

1. its wavelength,

.....[1]

2. its frequency.

.....[1]

(ii) State how the wavelength of violet light in air differs from the wavelength of red light in air.

.....[1]

[Total: 7]

3.

(a) Fig. 7.1 shows a convex lens being used to produce an image of an object.

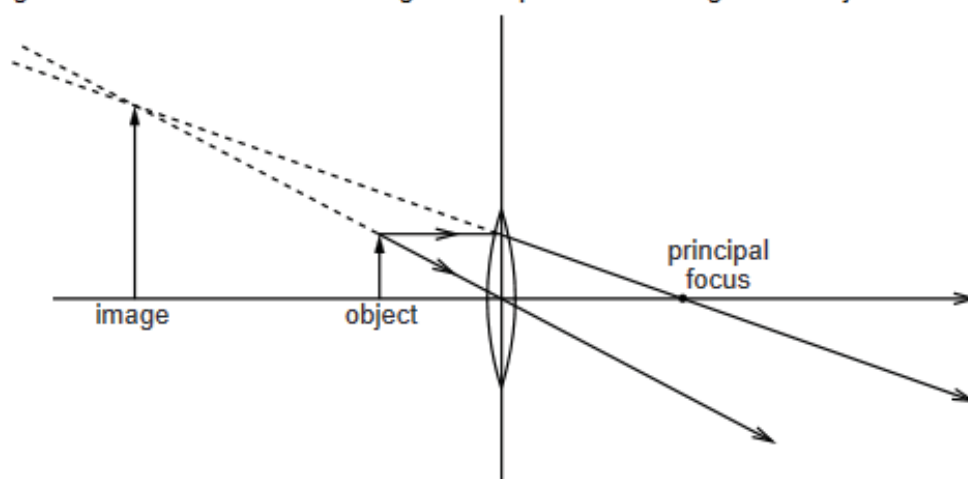


Fig. 7.1

(i) Place **three** ticks in the table that describe this image.

can only be formed on a screen	
diminished	
enlarged	
inverted	
real	
same size	
upright	
virtual	

[3]

(ii) On Fig. 7.1, mark a letter E to indicate a possible position for an eye to be placed to observe this image. [1]

(iii) State an application in which a convex lens is used in this way.

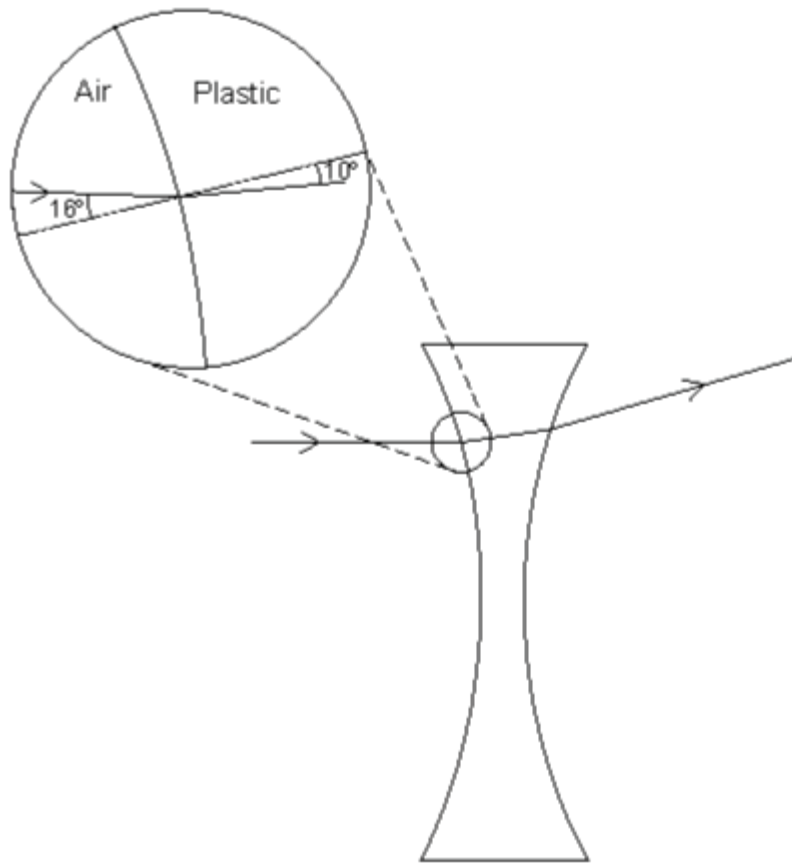
.....[1]

(b) In the space below, draw a ray diagram to locate the image of an object of height 1.0 cm placed 5.0 cm from a convex lens of focal length 2.0 cm. Draw your diagram full size. You are advised to locate the lens roughly in the centre of the space. Label the image.

[3]

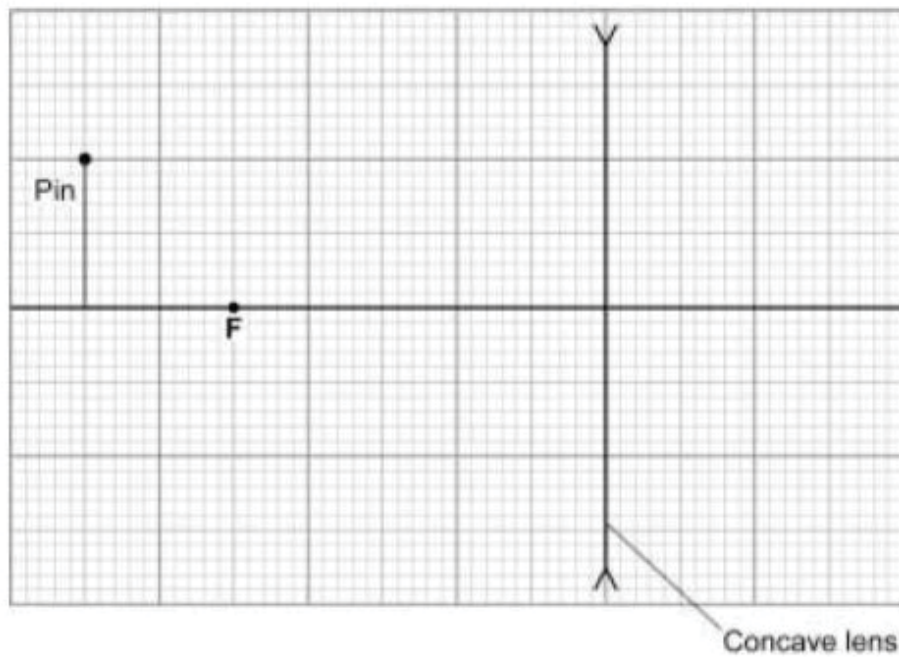
[Total: 8]

4. The diagram shows a ray of light passing through a diverging lens.



- (b) The focal length of the lens is 5 cm. A student looking through the lens sees the image of a pin.

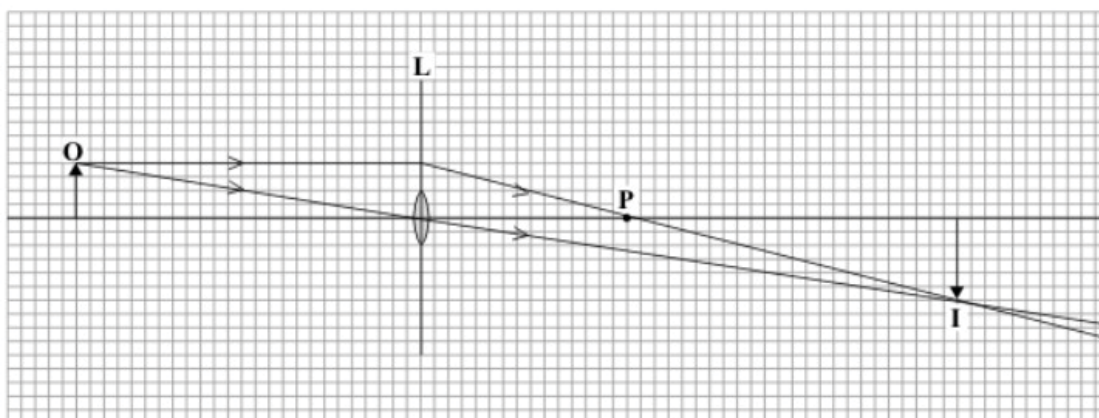
Complete the ray diagram below to show how the image of the pin is formed.



(3)

5.

The ray diagram shows the position and size of the image, **I**, of an object, **O**, formed by a lens, **L**.



(a) What type of lens is shown in the ray diagram?

.....

(1)

(b) Name the point labelled **P**.

.....

(1)

(c) The ray diagram has been drawn to scale.

Use the equation in the box to calculate the magnification.

$\text{magnification} = \frac{\text{image height}}{\text{object height}}$

Show clearly how you work out your answer.

.....

Magnification =

(2)

(d) How can you tell from this ray diagram that the image is a real image?

.....

(1)

(Total 5 marks)