Lenses PPQs

Name ………………

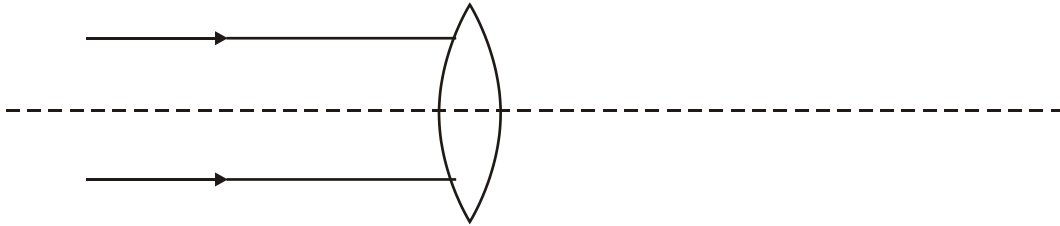**1.** (a) The diagram shows two parallel rays of light, a lens and its axis.

(i) Complete the diagram to show what happens to the rays.

(2)

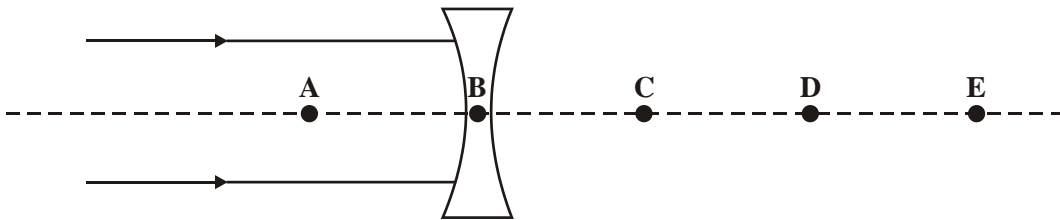(ii) Name the point where the rays come together.

....

(1)

(iii) What word can be used to describe this type of lens?

....

(1)

(b) The diagram shows two parallel rays of light, a lens and its axis.

(i) Which point **A**, **B**, **C**, **D** or **E** shows the focal point for this diagram?

Point ....

(1)

(ii) Explain your answer to part (b)(i).

....

....

(1)

(iii) What word can be used to describe this type of lens?

....

(1)

(c) Complete the following **three** sentences by crossing out the **two** lines in each box which are wrong

In a camera a converging lens is used to produce an image on a
film
lens
screen
.

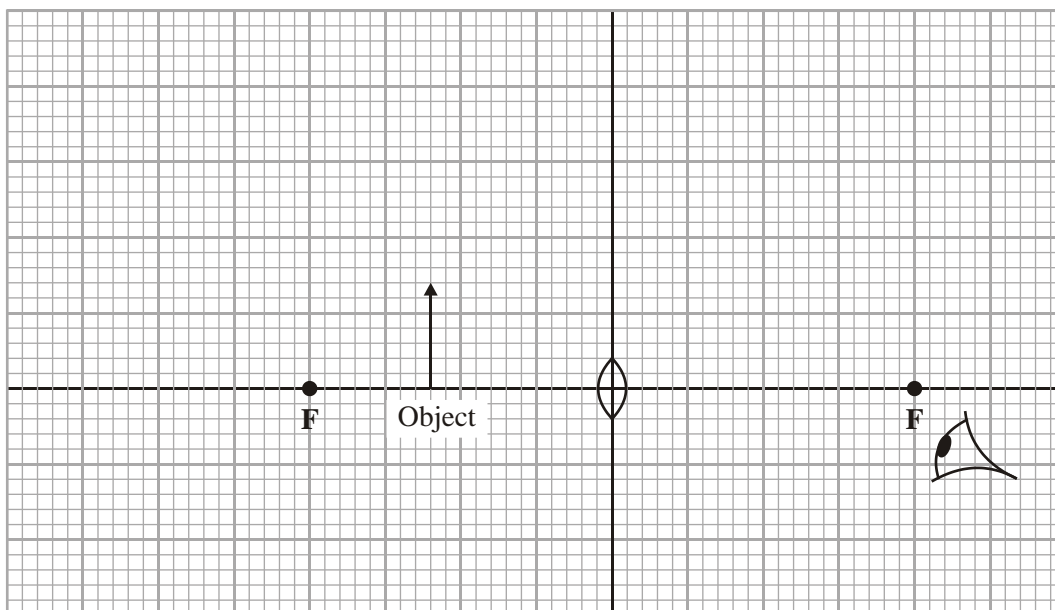| | larger than | |
| The image is | smaller than | the object. |
| | the same size as | |

Compared to the distance of the image from the lens, the object is	further away from
	nearer to
	the same distance from

the lens.

(3)
(Total 10 marks)

2. The diagram shows a converging lens of focal length 4 cm being used as a magnifying glass.
An object 1.6 cm tall is placed 2.4 cm from the lens.

(a) On the diagram, use a ruler to construct accurately the position and size of the image. You should show how you construct your ray diagram and how light appears to come from the image to the eye.

(4)

(b) The image is *virtual*. What is a *virtual* image?

....

....

(1)

(c) Calculate the magnification produced by the lens. Show clearly how you work out your answer.

..

....

magnification = …………………………..

(2)
(Total 7 marks)

3. (a) Four pieces of apparatus are shown below.

converging lens   diverging lens   glass block   plane mirror
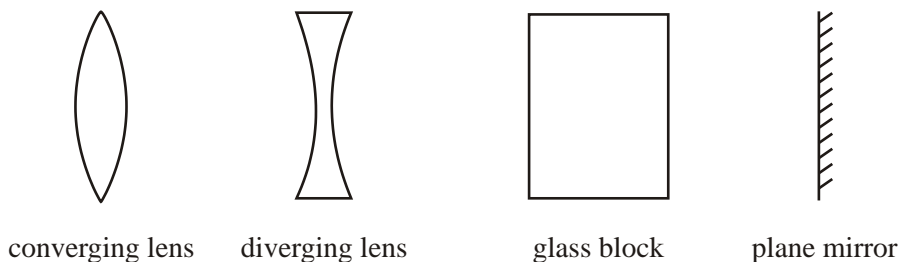
Each box below contains a piece of apparatus. The lines show light rays going into and out of the boxes.

In each box, draw **one** piece of apparatus (from the four above) that affects the light rays in the way shown. Use each piece of apparatus once only.

P

Q

R

S
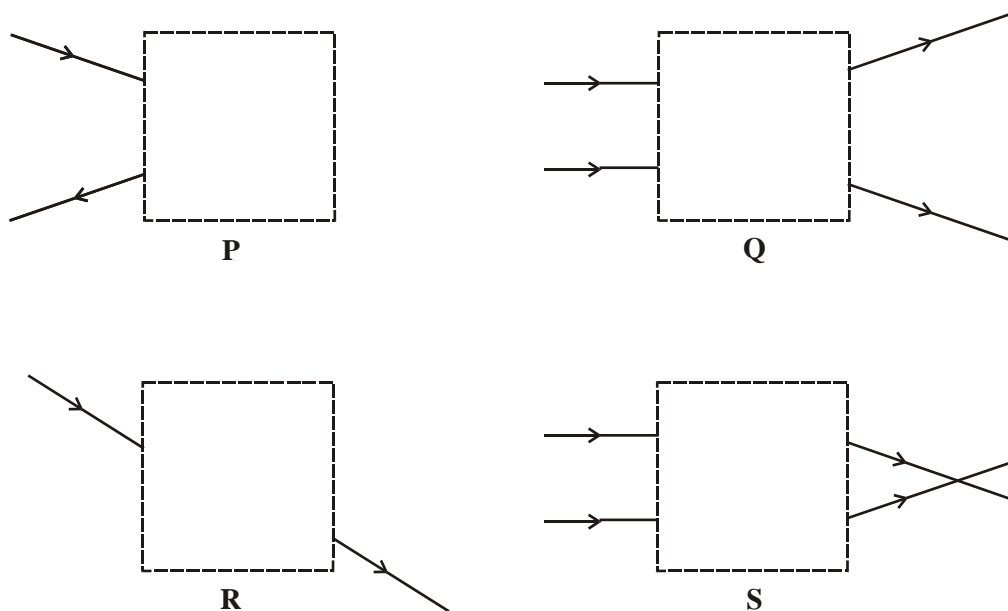
(3)

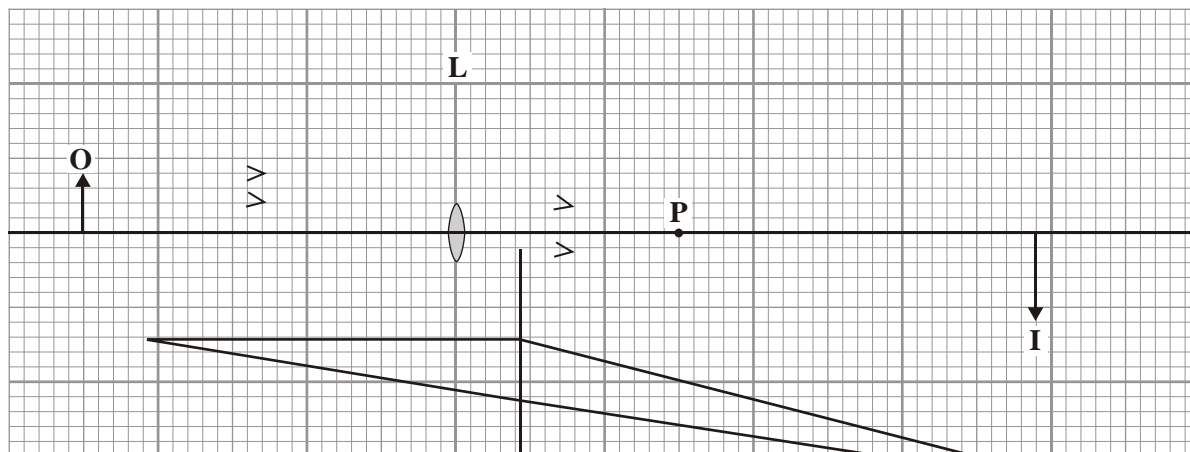(b) The diagram shows a solar cooker being used to heat water. The pan of water is at the focus of the mirror.

Pan of water
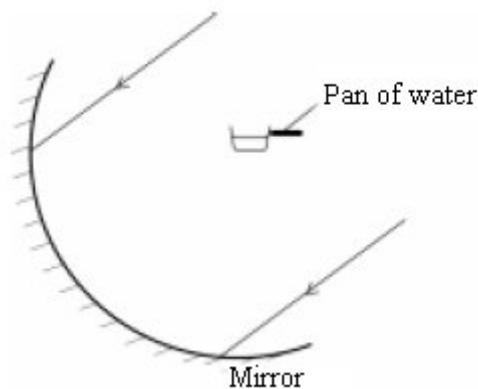
Mirror

Complete the diagram to show the path of the **two** light rays after they hit the mirror.

(2)
(Total 5 marks)

4. 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)