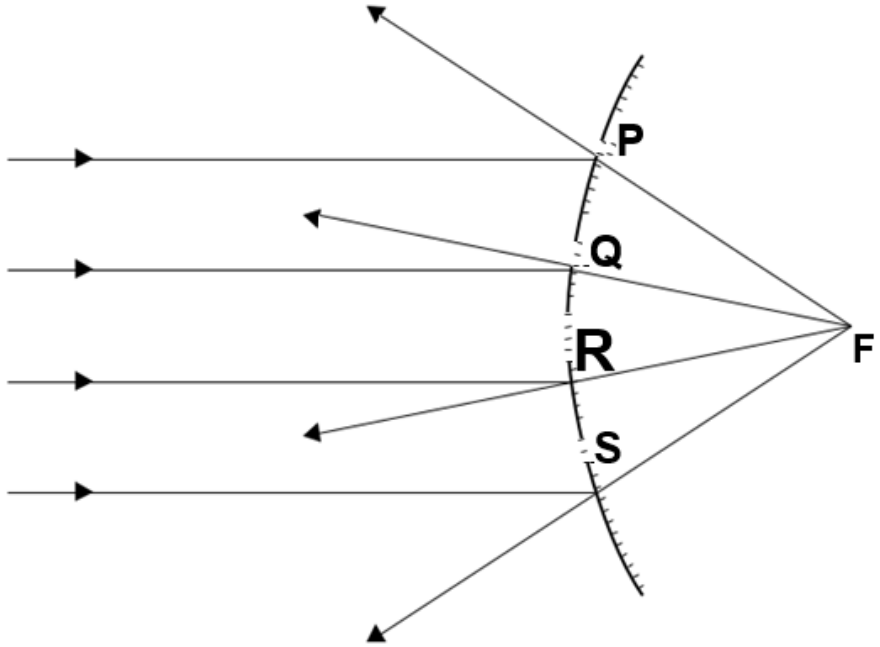
LENSES AND RAY DIAGRAM 2

Q1. A student uses a ray box and a curved mirror.

The diagram shows the mirror and parallel rays of light from the ray box.



(a) (i) What type of mirror is shown in the diagram?

_____

(1 mark)

(ii) What is point F called ?

_____

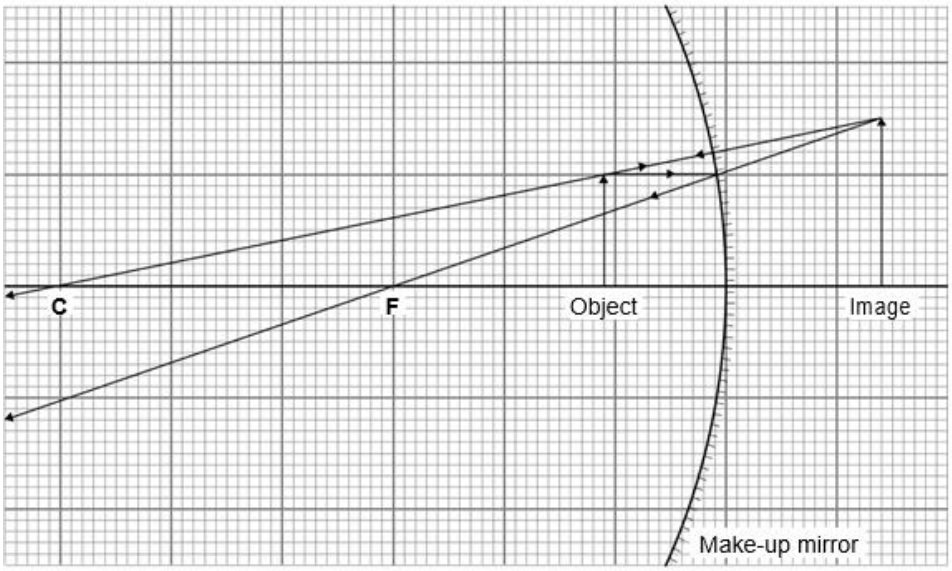
(1 mark)

(a) (iii) What is the process that takes place at points P, Q, R and S ?

_____

(1 mark)

(b) The diagram shows an object and its image in a curved make-up mirror.



(b) (i) What type of mirror is shown in the diagram ?

_____

(1 mark)

(b) (ii) Use the equation in the box to calculate the magnification produced by the mirror.

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

Show clearly how you work out your answer.

_____

_____

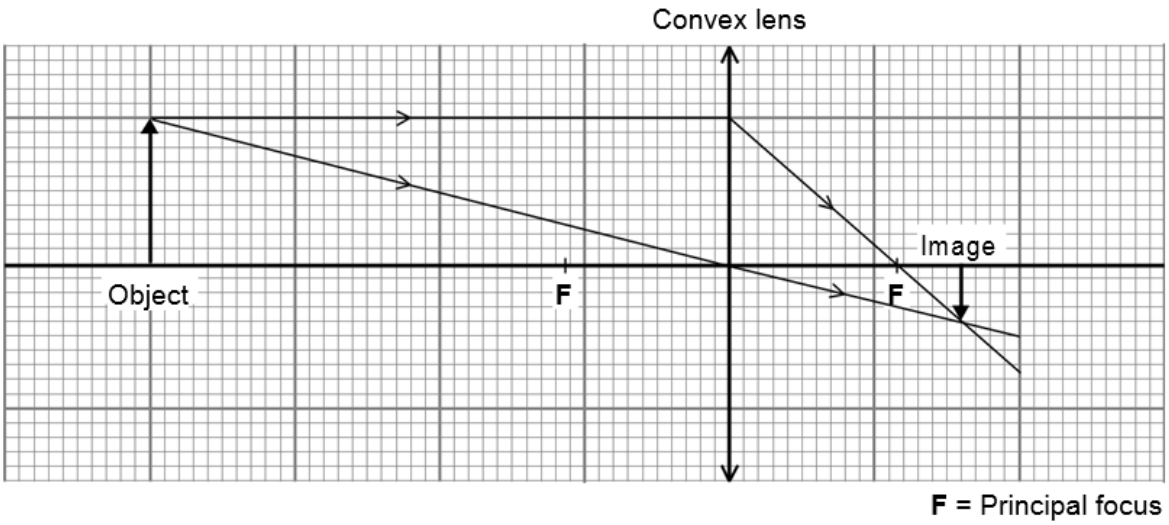
_____

_____

Magnification = _____

(2 marks)

Q2. A camera was used to take photographs of the rafts. The camera contains a convex (converging) lens. The ray diagram shows how the lens produces an image.



(i)

Which two words from the list describe the nature of the image?

Draw a ring around each of the two correct answers.

upright	**magnified**	**inverted**	**virtual**	**real**

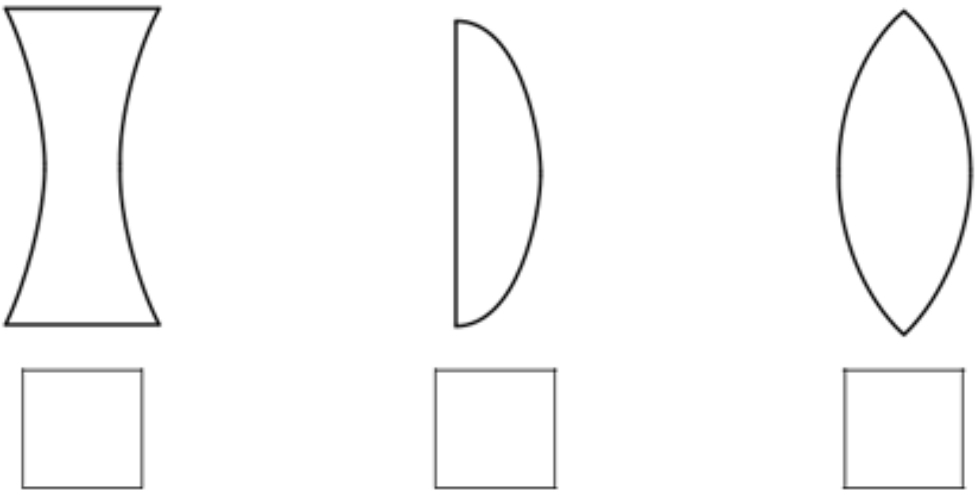
(2 marks)

(b) (ii) Use information from the ray diagram to calculate the magnification of the image. Use the correct equation from the Physics Equations Sheet.

Magnification = _____

(2 marks)

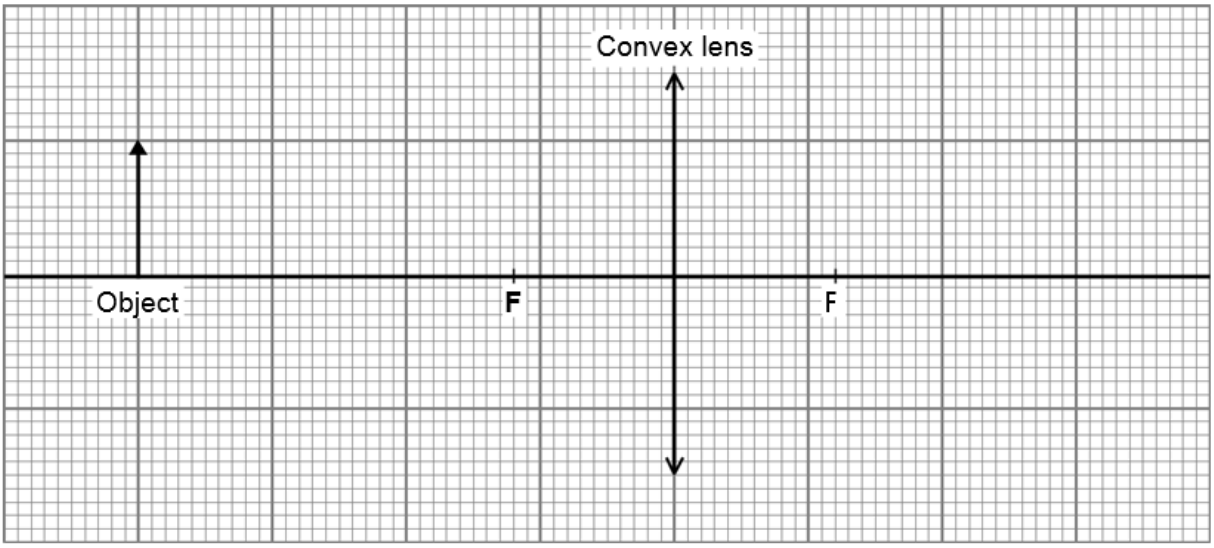
(c) A different type of lens is a concave (diverging) lens. Which diagram shows a concave (diverging) lens? Tick (✓) one box.



(1 mark)

Q3 A camera was used to take photographs of the rafts. The camera contains a convex (converging) lens.

(a) Complete the ray diagram to show how the lens produces an image of the object.



F = Principal focus

(4 marks)

(b) State two words to describe the nature of the image produced by the lens in the camera.

1 _____

2 _____

(2 marks)

Q4. Every lens has a focal length.

(a) Which factor affects the focal length of a lens?

Tick (✓) one box.

The colour of the lens	☐
The refractive index of the lens material	☐
The size of the object being viewed	☐

[1 mark]

(b)A lens has a focal length of 0.25 metres.

Calculate the power of the lens.

Use the correct equation from the Physics Equations Sheet.

_____

_____

Power of lens = _____ dioptres

[2 marks]

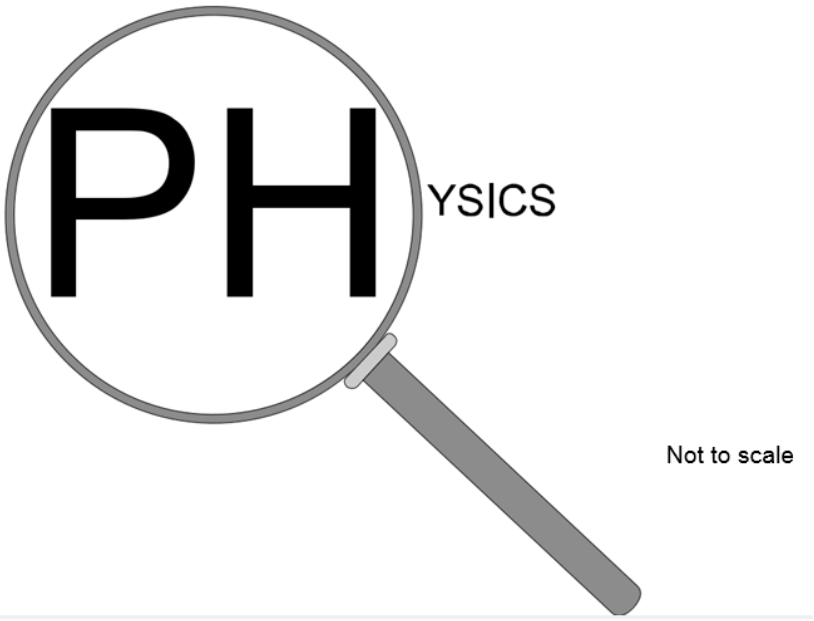
(c) Laser eye surgery can correct some types of eye defect. Which of the following is another medical use for a laser? Tick (☐) one box.

Cauterising open blood vessels	☐
Detecting broken bones	☐
Imaging the lungs	☐

[1 mark]

(d) Figure 5 shows a convex lens being used as a magnifying glass.

Figure 5



An object of height 14 mm is viewed through a magnifying glass.

The image height is 70 mm.

Calculate the magnification produced by the lens in the magnifying glass.

Use the correct equation from the Physics Equations Sheet.

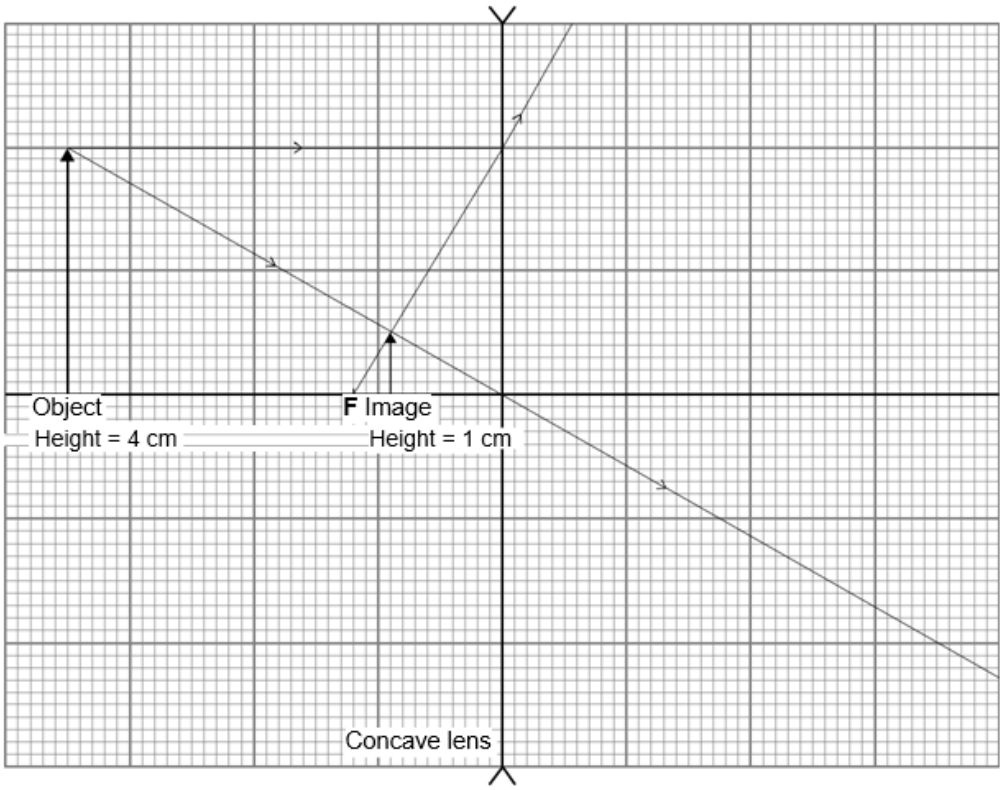
Magnification = _____

[2 marks]

Q5.A concave (diverging) lens is fitted into a door to make a security spyhole.

Figure 10 shows how this lens produces an image.

Figure 10



(a) State one word to describe the nature of the image in Figure 10.

_____

[1 mark]

(b)(ii) Use data from Figure 10 to calculate the magnification of the image.

Use the correct equation from the Physics Equations Sheet.

_____

_____

Magnification = _____

[2 marks]

(b) (iii) What is another use for a concave lens?

Tick (✓) one box.

A magnifying glass	☐
Correcting short sight	☐
To focus an image in a camera	☐

[1 mark]

Total: 27 marks