

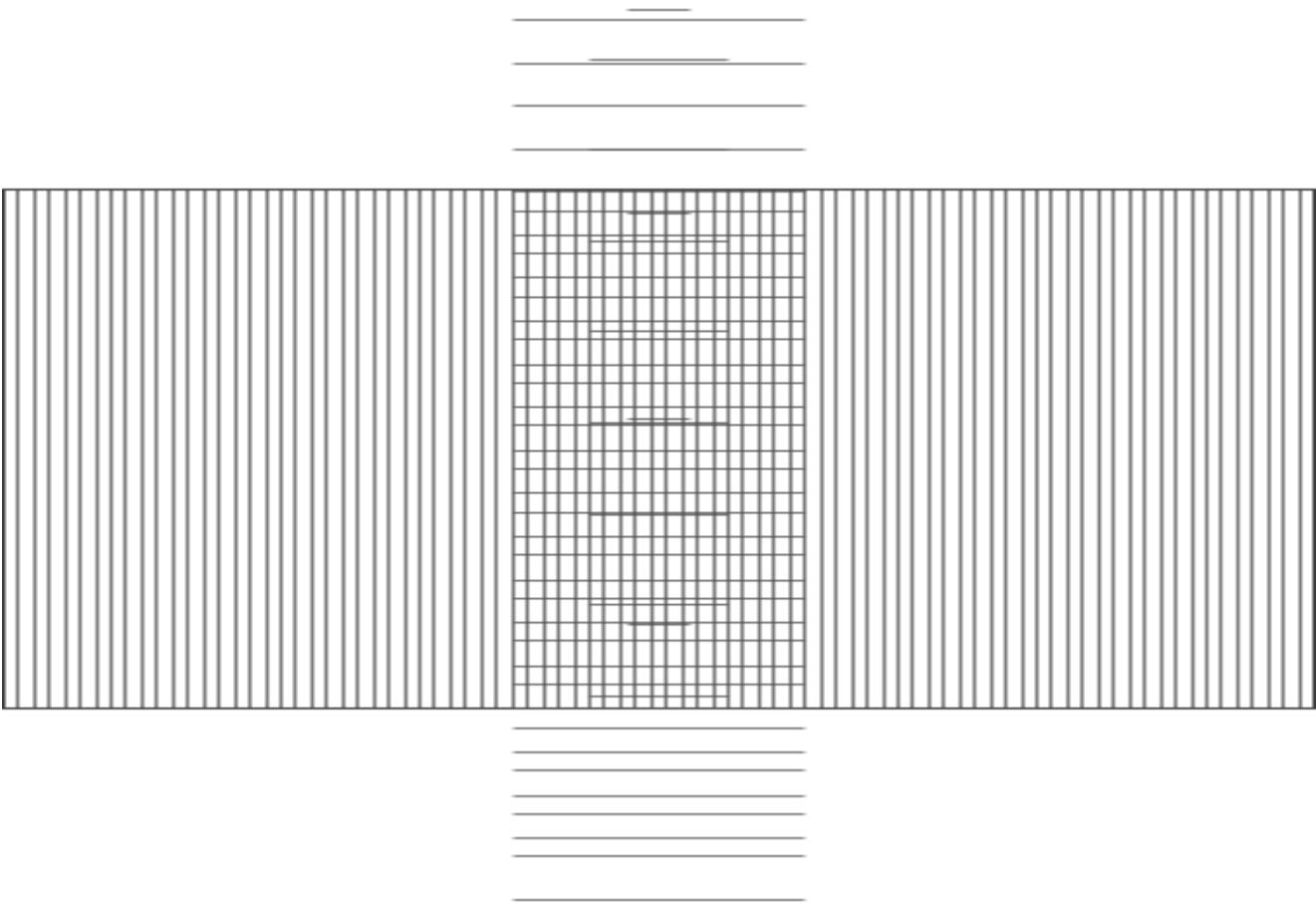
Reflection at curved surfaces

1. a) Define the term magnification as applied to curved mirrors.

b) The table below shows the results obtained in an experiment with a concave mirror.

Image distance V(cm)	20	25	30	35	40	45
Magnification (m)	1.0	1.5	2.0	2.5	3.0	3.5

i)



ii) Use your graph to determine the focal length of the mirror given that the equation relating **m** and **v** is such that: $m+1=\frac{v}{f}$

Reflection at curved surfaces and spherical surfaces

1. (a) The table below shows the object distance u and the corresponding image distance v of an

object placed in front of a convex lens.

u cm	20	25	30	40	50	70
v cm	20	16.7	15	13.3	12.5	11.5
$\frac{1}{u}$ cm ⁻¹						
$\frac{1}{v}$ cm ⁻¹						

(i) Complete the table by giving your answer to 3 d.p.

(ii) Plot a graph of $\frac{1}{v}$ (y axis) against $\frac{1}{u}$

(iii) From the graph, determine the focal length of the lens.

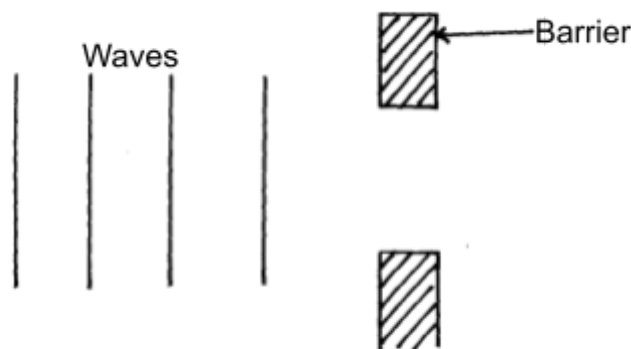
(b) State any **two** differences between human eye and the camera.

2. A battery is rated 120 AH. How long will it work if it steadily supplies a current of 4A.

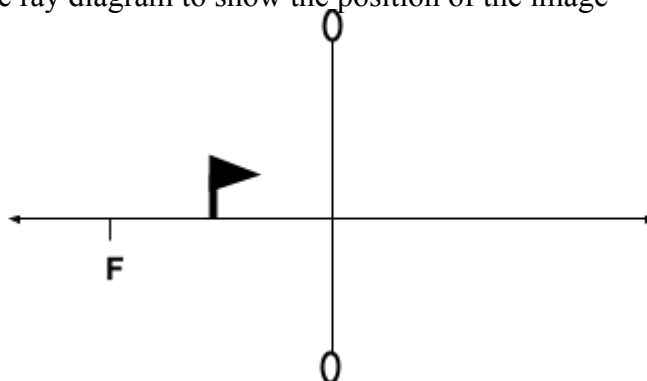
3. a) Distinguish between mechanical and electromagnetic waves

b) What is the relationship between periodic time and the frequency of a progressive wave

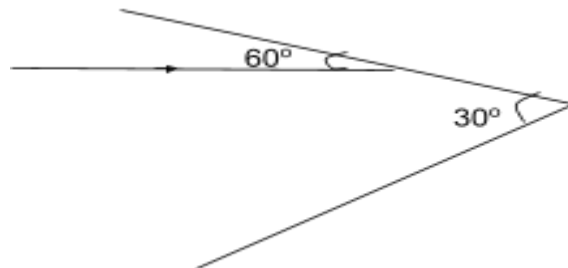
c) Complete the diagram below to show the shape of the wave fronts after passing the gap



4. Complete the ray diagram to show the position of the image



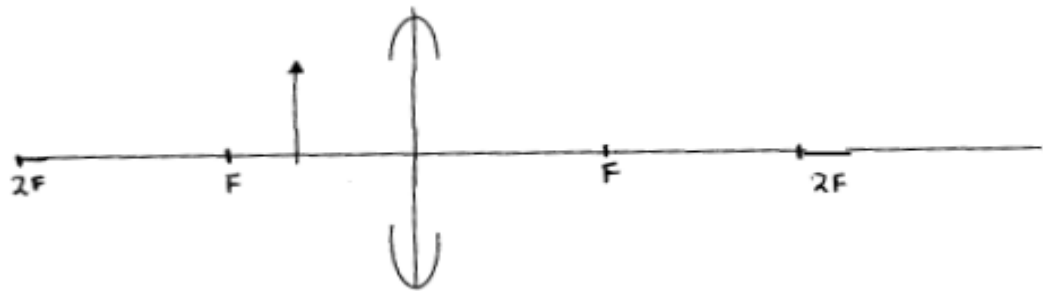
5. The figure below shows two mirrors inclined at an angle of 30° to each other. A ray of light is incident on one mirror as shown



Sketch the path of the ray to show its reflection on the two mirrors

6. What is meant by the term **spherical aberration**?

7. Cc



State **one** application of the set up above

8. A plain sheet of paper and a plane mirror both reflect light yet only the plane mirror forms images. Explain why the paper cannot form images.

9. Give **one** advantage and **one** disadvantage of using a convex mirror as a driving mirror

10. The table below shows the image distance **V** and the corresponding magnification, **M** for an object placed in front of a concave mirror.

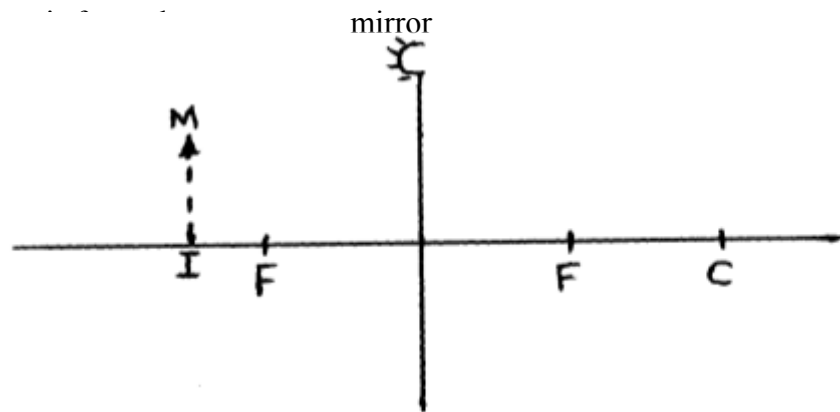
Magnification M	0.5	1.0	2.0	3.0	4.0	5.0	6.0
Image distance V(cm)	15	20	30	40	50	60	70

(a) Plot a graph of **V (y-axis)** against the magnification **M**

(b) From the graph, determine the focal length of the mirror

(c) Given the image **IM**, locate the position of the object **OB**. Use arrows to show how

the in



11. State the difference between a virtual image formed by a plane mirror and that formed by a concave mirror

12. Figure 1 shows an object O being viewed using two inclined mirrors M_1 and M_2 . Complete the diagram by sketching rays to show the position of the image as seen by the eye -E

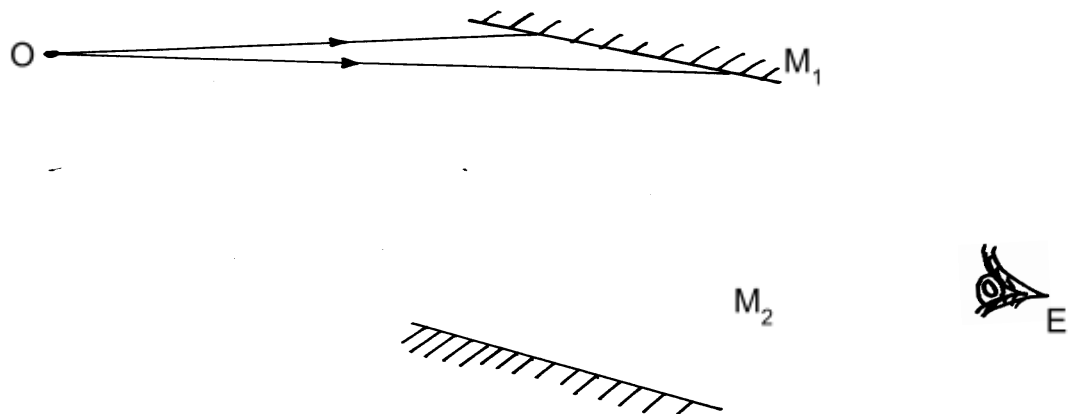
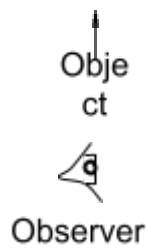


Fig 1.

13. The figure below shows an object placed in front of a plane mirror. Draw appropriate rays to locate the image as seen by the observer.



Plane
mirror

14. Define the following terms as used in curved mirrors:-

(i) Principal focus (F)

(ii) Focal length (f)

(b) By use of a ray diagram, show how a concave mirror may be a dentist mirror

(c) An object is placed 12cm from a convex mirror of radius of curvature 20cm. Calculate the position of the image

(d) (i) A lady holds a large concave mirror of focal length 1.8m from her face. State **two** characteristics of her image in the mirror

(ii) A boy is standing between two cliffs **A** and **B** but nearer to cliff **A** than **B**. He stands 160m

from wall **BA** and shouts once. He hears two echoes and discovers that the time between the

two echoes is 0.8 seconds. Determine how far the boy is standing from cliff **B** given that the speed of sound in air is 340m/s

