

Gh-1. Exploring the

Investigative World

of Science

• Question-Answer

1. Which are the three most important aspects of science?

A- i Observation
ii Experimentation and
iii. Drawing conclusions.

2. Who invented steam engine?

A- The first steam engine was built by Thomas Newcomen, and later improved by James Watt.

3. Who invented incandescent lamp?

A- Thomas Edison

4. What are micro-organisms?

A- The organisms which cannot be seen with naked are called micro-organisms.

5 Give two examples of useful microbes.

- A- i Lactobacillus bacteria - Making of curd.
ii Fungus [yeast] - Fermentation.

6 What is cell?

A- Cell is the basic unit of all living organisms.

7 State the use of heating effect of electric current.

A- The heating effect of electric current is used to light bulbs, run a room heater or geyser, boil water in electric kettle, etc.

8 State the use of magnetic effect of electric current.

A- The magnetic effect of current is used to study electromagnet which is used across various devices like electric bell and loudspeaker, to power electric motors and generators, create magnetic field for MRI machines and to separate scrap metals.

9 What is force?

A- The push or pull applied on an object is called forces.

10 Define Pressure.

A- Force applied per unit area is called Pressure

11 What is light

A- Light is a form of energy which enables us to see the world around us.

12 Who explained the occurrence of eclipses?

A- Aryabhata

13 What was the other major statement given by Aryabhata

A- The westward movement of the sun and other stars is due to the Earth's rotation on its own axis.

14 What does science teaches us?

A- Science teaches us to think critically, solve problems and make decisions based on evidence rather than guesses.

15 How is scientific thinking helpful to us?

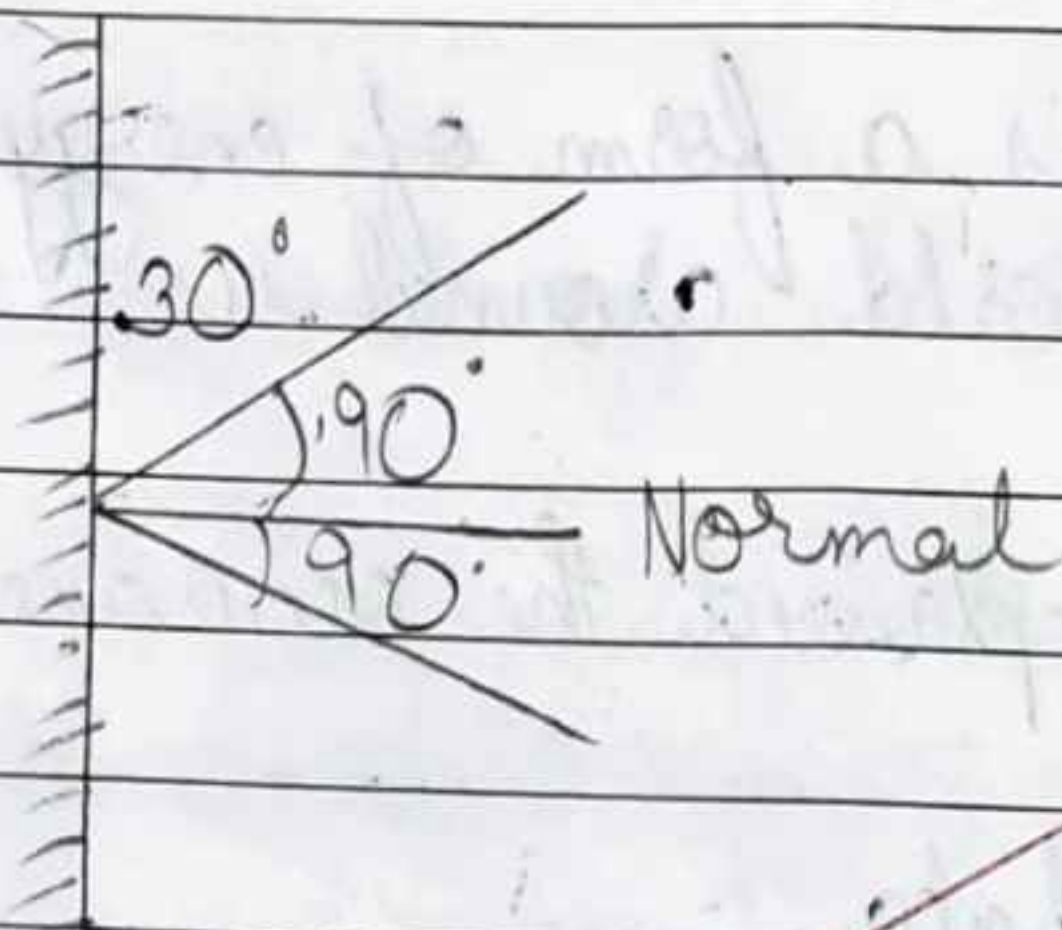
A- Scientific thinking helps us gain knowledge to improve our lives and protect our planet.

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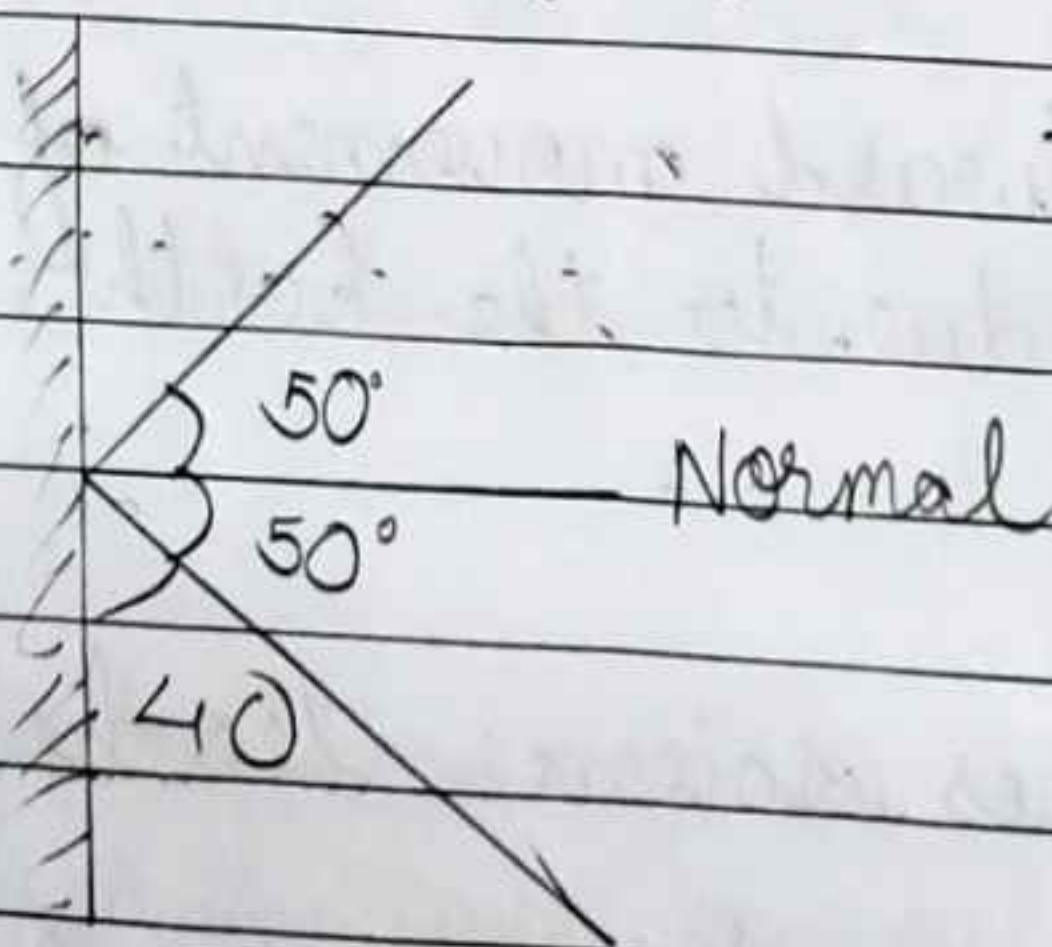
Ch-10 Light

• Extra Questions.

1. The angle formed between the incident ray & Plane mirror is 30° then find out the angle of reflection

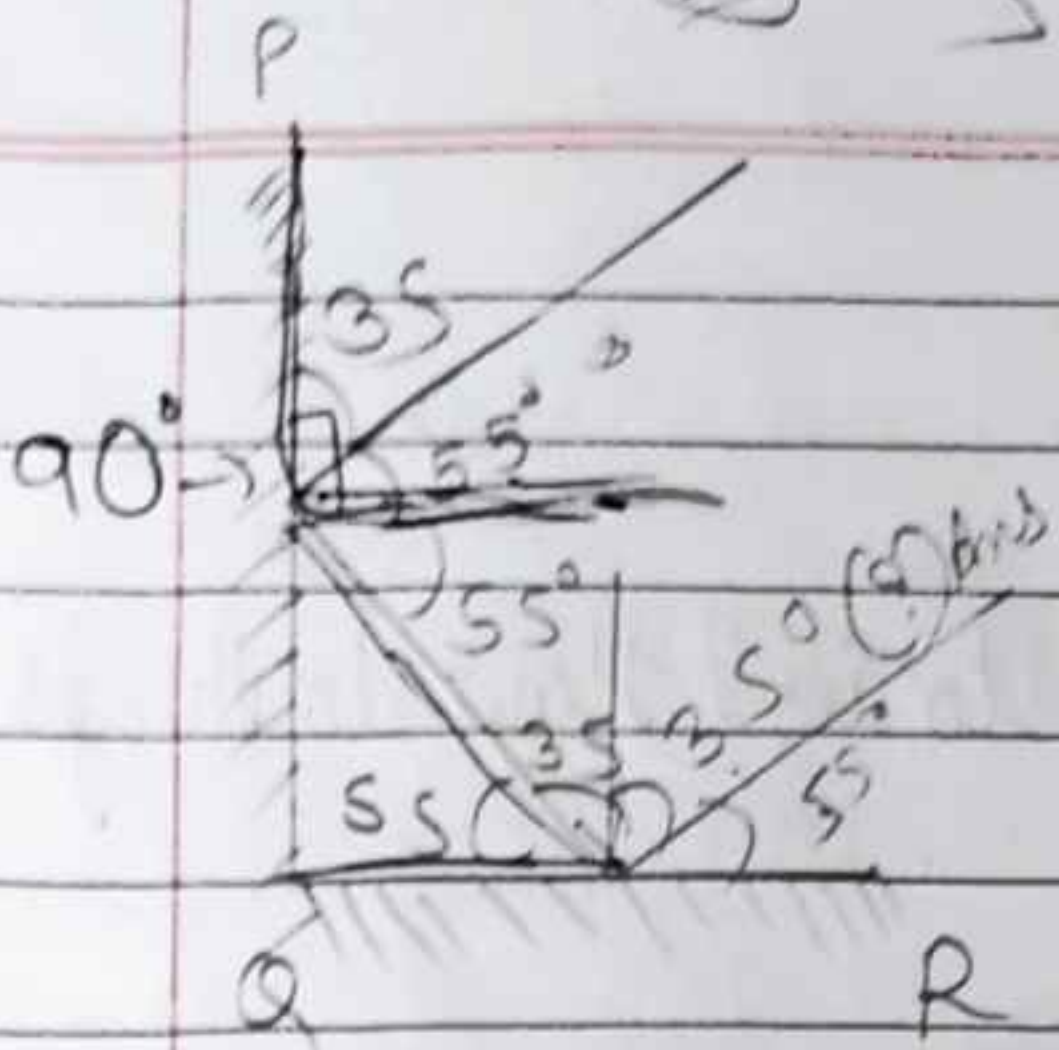


2. The angle formed between the incident ray & normal is 50° then find out angle formed by reflected ray & plane mirror

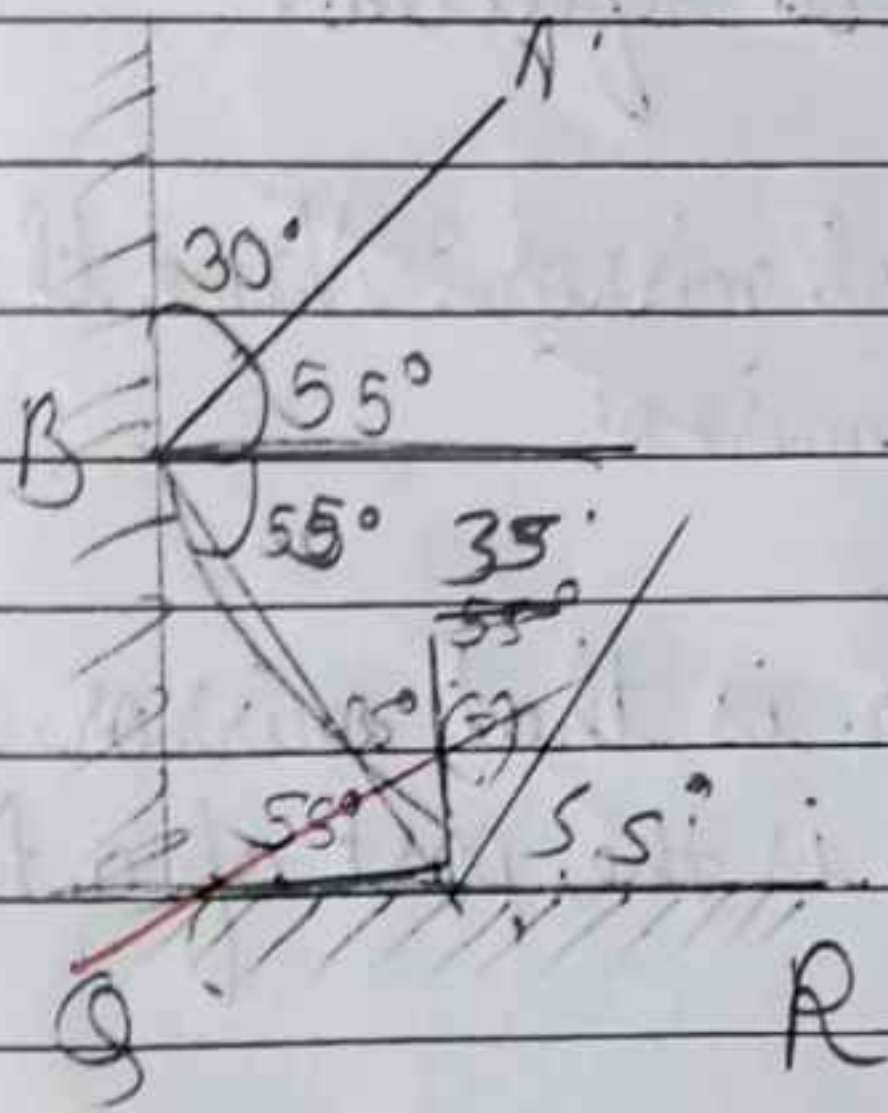


3. 2 plane mirror PQ & QR are kept at right angle, a ray of light incident on plane mirror PQ forms an angle of 35° with the plane mirror PQ then find out the angle between the reflected ray & normal of plane mirror QR

$\Sigma = \text{Alternate}$



Pg-169 Sample Problem-2



• Characteristics of image formed spherical mirror and lenses.

Mirror/Lenses $R = 10\text{cm}$	Position of object	Type of image
i. Concave mirror or Convex Lens.	a) Very far.	Real, inverted, diminished.
	b) Beyond $2R$ (25cm)	Real, inverted, diminished.
	c) Between R & $2R$ (15cm)	Real, inverted, diminished.
	d) Very close (5cm)	Virtual, erect, enlarged.
ii. Convex mirror Concave lens	No matter where the object is placed	Virtual, erect, enlarged,

• Short Answers

1 What makes things visible to us? How do things become visible to us?

Ans It is light which makes things visible to us. Light enables us to see things from which it comes or from which it is reflected.

2 What is a spherical mirror? Name the different types of spherical mirror.

Ans A spherical mirror is that mirror whose reflecting surface is the part of a hollow sphere of glass.

• The spherical mirror are of two types:

- i Concave mirror
- ii Convex mirror

3 The adjacent figure shows three different situation where light ray falls on a mirror.

Ans a.



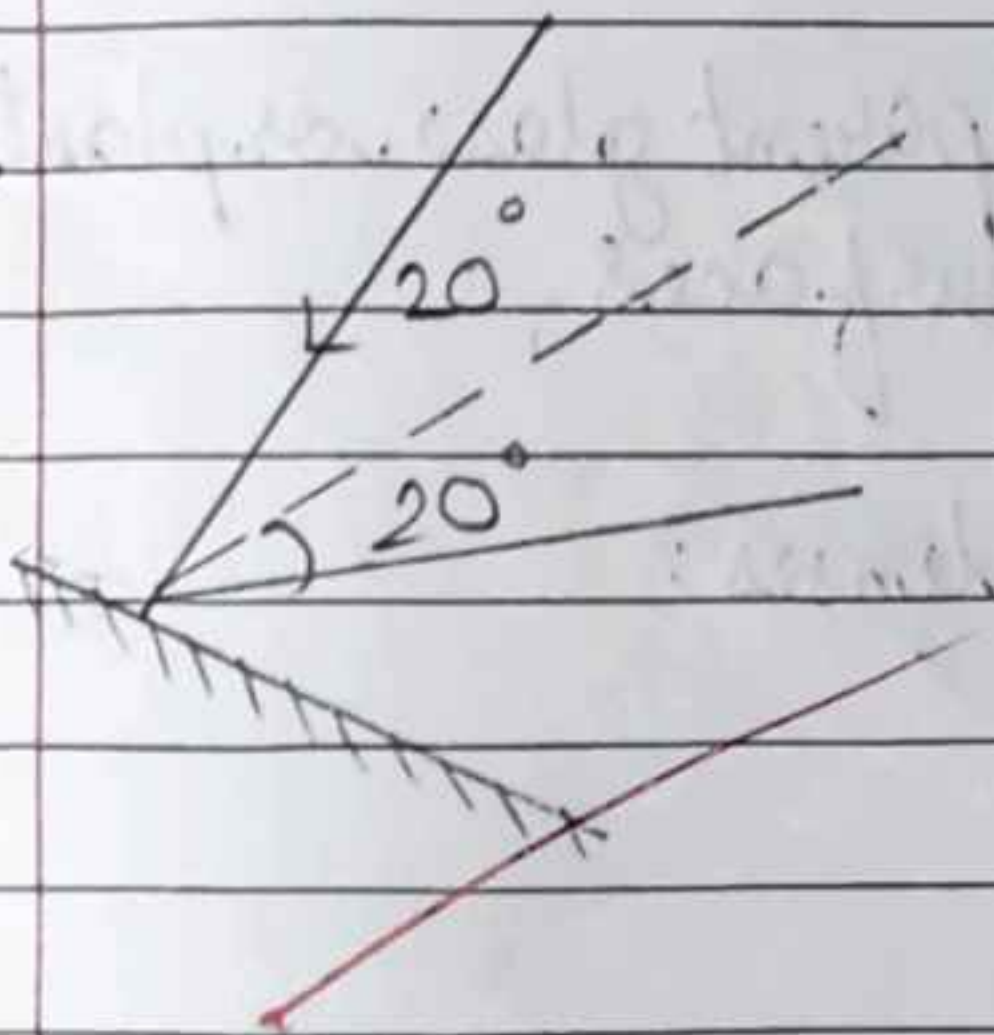
Angle of reflection = 0°

b.



Angle of reflection = 0°

c.



Angle of reflection = 20°

6 Why does a parting in our hair on the left appear to be a parting on the right when seen in a mirror?

Ans The image formed in the plane mirror is always laterally inverted.

7 State the laws of reflection of light.

Ans i The incident ray, the reflected ray, and the normal (at the point of incidence), all lie in the same plane.

ii The angle of reflection is always equal of incidence.

• Long Answer.

- 1 a. What is lens? Name the two types of lenses. Name any five things which use lenses.
- b. What kind of lens is used as a magnifying glass?
- c. Which types of reflector is used in car headlights for producing a parallel beam of light.

Ans a. A lens is a piece of transparent glass or plastic bound by two spherical surfaces.

→ There are two types of lenses:

- i. Concave lenses
- ii. Convex lenses

→ The lenses are used in making spectacles, magnifying glass, camera, microscope, telescope and binoculars.

b. Convex lens

c. Concave mirror

2 a. What are the characteristics of image formed by concave mirror and concave lens?

b. What type of image can a convex mirror & lens make?

a) i. When the object is placed closer to the concave mirror, the image is erect and magnified. When the object is moved away from the mirror, the image becomes inverted. As the object moves further from the mirror, the size of the image gradually becomes smaller.

ii When an object is placed behind a concave lens, the image formed is always erect and diminished in size than the object.

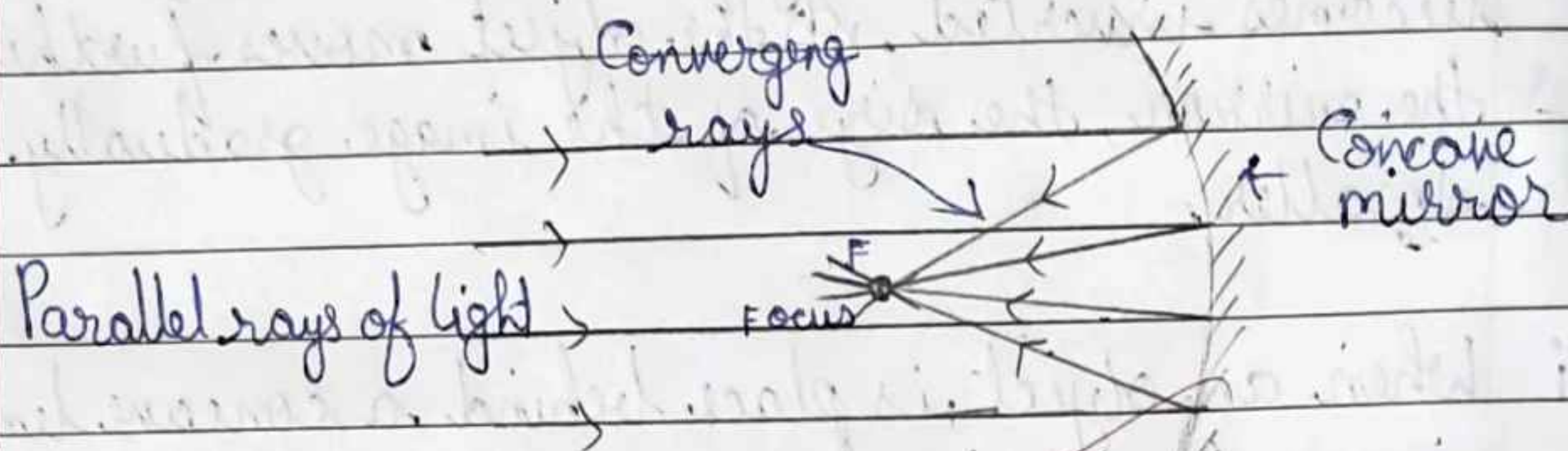
b) i In a convex mirror wherever you place the object i.e., near or far, the image is always erect and diminished in size.

ii When an object is placed very close to a convex lens, the image appears erect and magnified than the object. But if the distance between the lens and the object increases, the image appears inverted with diminished size. A convex lens can form magnified or diminished image depending on the position of the object and the lens.

3 What will you observe when beams of light fall on concave and convex mirror? Explain with diagram?

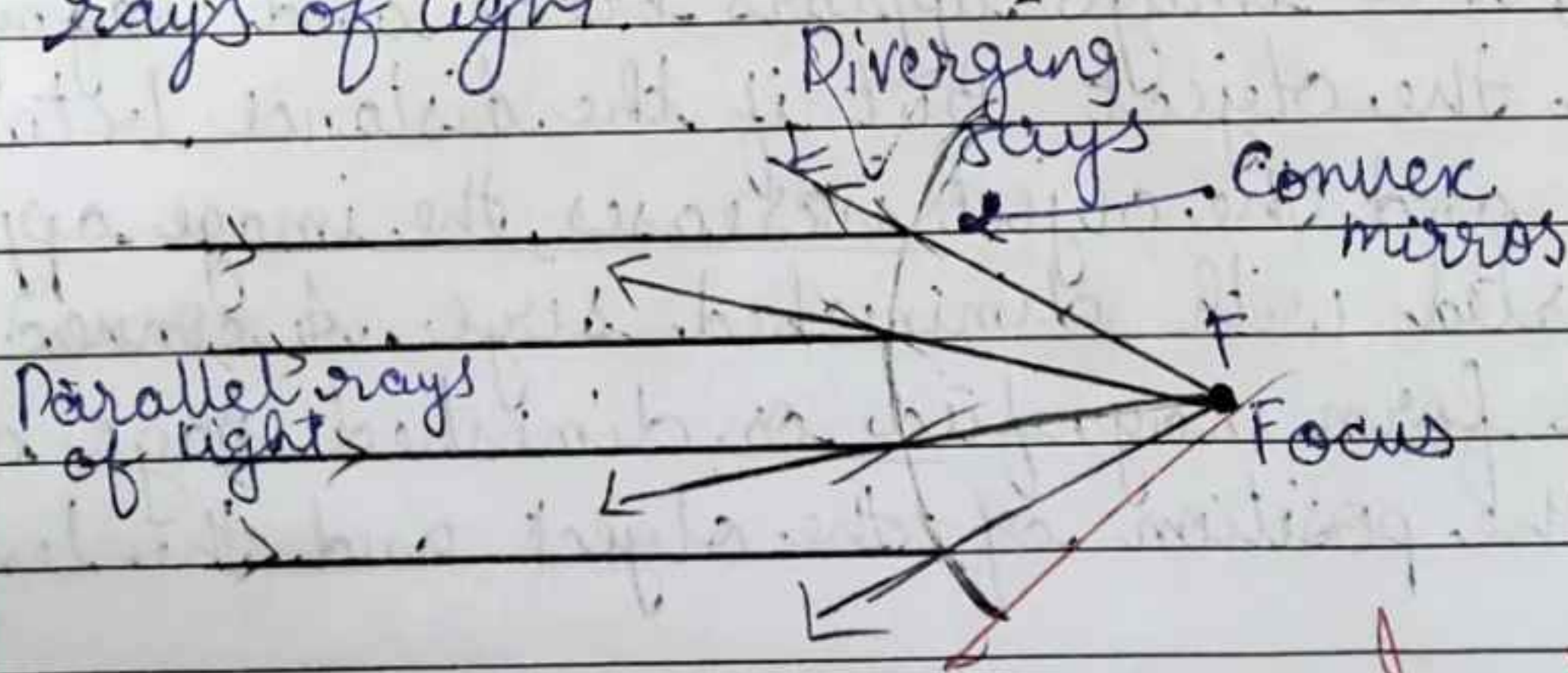
Ans. Concave mirror - When the beam of light falls on concave mirror, they reflect back in front of the mirror and come closer.
[converging rays]

• Figure-17. A concave mirror brings closer a beam of parallel rays of light.



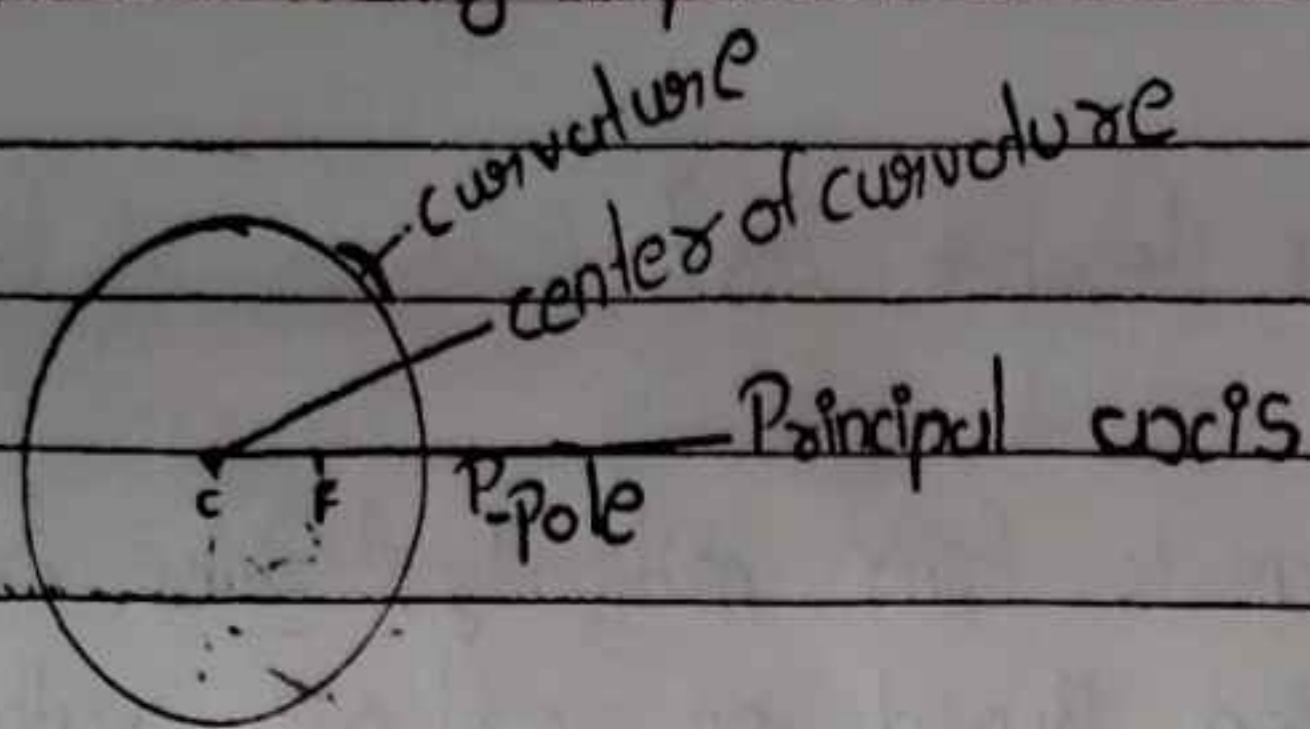
Convex mirror - When the beam of light falls on convex mirror, we see that the reflecting rays move away from each other.
 [Diverging rays]

• Fig-18. A convex mirror diverges a beam of parallel rays of light.



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ch-10 light, Mirror and lens



CP = distance from curvature to Pole
 also know Radius.

f = focus or focal Point C = center of curvature

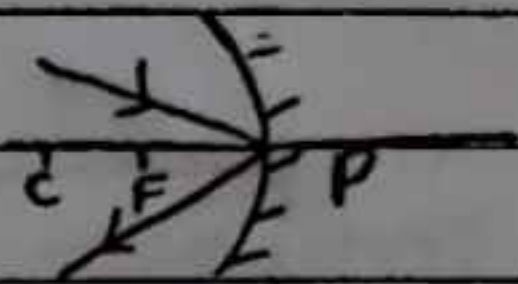
FP = distance from

$$F \text{ to } P = \frac{R}{2}$$

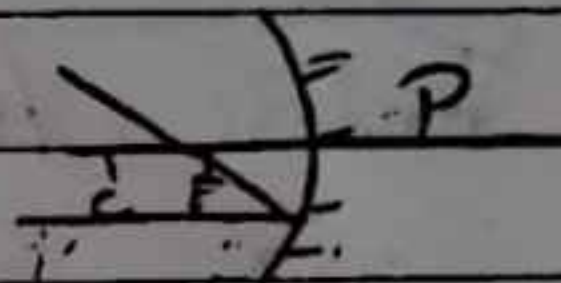
Object Position	Image Position	Nature	Size
at ∞	at F	i) real	i) diminished
beyond C	Between C & F	ii) real and inverted	ii) smaller
at C	at C	iii) real	iii) Same
between C & F	Beyond C	iv) real	iv) larger
at F	at ∞	v) real	v) magnified
Between F & P	Behind the mirror	vi) virtual & erect.	vi) larger from object.

To form an image in spherical mirror

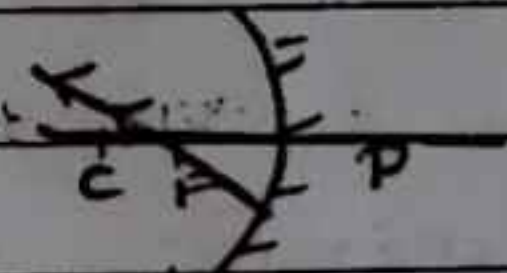
i) if a light ray parallel to P.A. then it passes from F after reflection.



ii) if light ray passes from F then it reflects parallel to P.A.



iii) if light ray passes from C, it reflects from same path from C only.



iv) if light falls at pole then it reflects at same angle.

