RG CLASSES

CLASS X - LIGHT(REFLECTION)

40 MOST IMPORTANT

1. The laws of reflection hold true for a) plane mirrors only (b) concave mirrors only (c) convex mirrors only (d) all reflecting surface
2. List four characteristics of the images formed by plane mirrors.
3. State the two laws of reflection of light.
4. When an object is kept within the focus of a concave mirror, an enlarged image is formed behind the mirror. This image is (a) real (b) inverted (c) virtual and inverted (d) virtual and erect (2020)
5. What is the magnification of the images formed by plane mirrors and why?
6. Draw a labelled ray diagram to show the path of the reflected ray corresponding to an incident ray of light parallel to the principal axis of a convex mirror. Mark the angle of incidence and angle of reflection on it. (AI 2019)
7. If the image formed by a spherical mirror for all positions of the object placed in front of it is always erect and diminished , what type of mirror is it? Draw a labelled ray diagram to support your answer.
8. An object is placed at a distance of 30 cm in front of a convex mirror of focal length 15 cm. Write four characteristics of the image formed by the mirror.

Or

List four specific characteristics of the images of the objects formed by convex mirrors.

9. An object is placed at a distance of 12 cm in front of a concave mirror of radius of curvature 30 cm. List four characteristics of the image formed by the mirror.
10. A ray of light is incident on a convex mirror as shown. Redraw the diagram and complete the path of this ray after reflection from the mirror. Mark angle of incidence and angle of reflection on it.
11. Name the type of mirrors used in the design of solar furnaces. Explain how high temperature is achieved by this device.
12. “The magnification produced by a spherical mirror is -3”. List four informations you obtain from this statement about the mirror/ image.
13. AB and CD, two spherical mirrors, from parts of a hollow spherical ball with its centre at O as shown in the diagram. If arc AB = $\frac{1}{2}$ arc CD, what is the ratio of their

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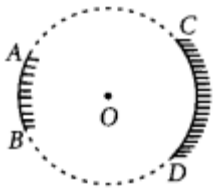
focal lengths? State which of the two mirrors will always form virtual image of an object placed in front of it and why?



14. List two properties of the images formed by convex mirrors. Draw ray diagram in support of your answer.
15. The linear magnification produced by a spherical mirror is +3. Analyse this value and state the (i) type of mirror and (ii) position of the object with respect to the pole of the mirror. Draw a ray diagram to show the formation of image in this case.
16. Draw a ray diagram to show the path of the reflected ray corresponding to an incident ray which is directed towards the principal focus of a convex mirror. Mark on it the angle of incidence and the angle of reflection. (Delhi 2014)
17. Draw a ray diagram to show the path of the reflected ray corresponding to an incident ray of light parallel to the principal axis of a concave mirror. Mark the angle of incidence and angle of reflection on it.
18. List two possible ways in which a concave mirror can produce a magnified image of an object placed in front of it. State the difference if any between these two images.
19. The image formed by a concave mirror is observed to be virtual, erect and larger than the object. Where should the position of the object be relative to the mirror? Draw ray diagram to justify your answer.
20. The linear magnification produced by a spherical mirror is +1/3. Analysing this value state the (i) type of mirror and (ii) position of the object with respect to the pole of the mirror. Draw any diagram to justify your answer. (AI 2014, Foreign 2014)
21. The linear magnification produced by a spherical mirror is -1. Analysing this value state the (i) type of mirror and (ii) position of the object with respect to the pole of the mirror. Draw any diagram to justify your answer. (Foreign 2014)
22. The linear magnification produced by a spherical mirror is -1/5. Analysing this value state the (i) type of spherical mirror and (ii) the position of the object with respect to the pole of the mirror. Draw ray diagram to justify your answer. (Foreign 2014)
23. Draw ray diagrams for the following cases when a ray of light: (i) passing through centre of curvature of a concave mirror is incident on it.(ii) parallel to principal axis is incident on convex mirror.(iii) is passing through focus of a concave mirror incident on it. (2020)
24. A concave mirror is used for image formation for different positions of an object. What inferences can be drawn about the following when an object is placed at a distance of 10 cm from the pole of a concave mirror of focal length 15 cm?

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(a) Position of the image. (b) Size of the image. (c) Nature of the image. Draw a labelled ray diagram to justify your inferences. (2020)

25. A concave mirror has a focal length of 20 cm. At what distance from the mirror should a 4 cm tall object be placed so that it forms an image at a distance of 30 cm from the mirror? Also calculate the size of the image formed.
26. The image of a candle flame placed at a distance of 30 cm from a mirror is formed on a screen placed in front of the mirror at a distance of 60 cm from its pole. What is the nature of the mirror? Find its focal length. If the height of the flame is 2.4 cm, find the height of its image. State whether the image formed is erect or inverted.
27. An object 4 cm in height, is placed at 15 cm in front of a concave mirror of focal length 10 cm. At what distance from the mirror should a screen be placed to obtain a sharp image of the object. Calculate the height of the image.
28. The image of an object formed by a mirror is real, inverted and is of magnification -1. If the image is at a distance of 40 cm from the mirror, where is the object placed? Where would the image be if the object is moved 20 cm towards the mirror? State reason and also draw ray diagram for the new position of the object to justify your answer.
29. The image formed by a spherical mirror is real, inverted and its magnification is -2. If the image is at a distance of 30 cm from the mirror, where is the object placed? Find the focal length of the mirror. List two characteristics of the image formed if the object is moved 10 cm towards the mirror.
30. A spherical mirror produces an image of magnification -1 on a screen placed at a distance of 50 cm from the mirror. (a) Write the type of mirror. (b) Find the distance of the image from the object. (c) What is the focal length of the mirror? (d) Draw the ray diagram to show the image formation in this case.
31. A spherical mirror produces an image of magnification -1 on a screen placed at a distance of 40 cm from the mirror. (i) Write type of mirror. (ii) What is the nature of the image formed? (iii) How far is the object located from the mirror? (iv) Draw the ray diagram to show the image formation in this case.
32. A student wants to project the image of a candle flame on a screen 48 cm in front of a mirror by keeping the flame at a distance of 12 cm from its pole. (a) Suggest the type of mirror he should use. (b) Find the linear magnification of the image produced. (c) How far is the image from its object? (d) Draw ray diagram to show the image formation in this case.
33. A student wants to obtain an erect image of an object using a concave mirror of 12 cm focal length. What should be the range of distance of the candle flame from the mirror? State the nature and size of the image he is likely to observe. Draw a ray diagram to show the image formation in this case. (Foreign 2014)

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34. Mention the types of mirrors used as (i) rear view mirrors, (ii) shaving mirrors. List two reasons to justify your answer in each case.
35. Calculate the magnification of the image of an object placed perpendicular to the principal axis of a concave mirror of focal length 15 cm. The object is at a distance of 20 cm from the mirror.
36. An object 4.0 cm in size, is placed 25.0 cm in front of a concave mirror of focal length 15.0 cm.
37. (i) At what distance from the mirror should a screen be placed in order to obtain a sharp image? (ii) Find the size of the image. (iii) Draw a ray diagram to show the formation of image in this case. (2020)
38. (a) A security mirror used in a big showroom has radius of curvature 5 m. If a customer is standing at a distance of 20 m from the cash counter, find the position, nature and size of the image formed in the security mirror.
    (b) Neha visited a dentist in his clinic. She observed that the dentist was holding an instrument fitted with a mirror. State the nature of this mirror and reason for its use in the instrument used by dentist. (2020)
39. A concave mirror produces three times magnified image on a screen. If the objects placed 20 cm in front of the mirror, how far is the screen from the object?
40. Suppose you have three concave mirrors A, B and C of focal lengths 10 cm, 15 cm and 20 cm. For each concave mirror you perform the experiment of image formation for three values of object distances of 10 cm, 20 cm and 30 cm. By giving reason, answer the following:
    (a) For the three object distances, identify the mirror/mirrors which will form an image of magnification -1.
    (b) Out of the three mirrors, identify the mirror which would be preferred to be used for shaving purposes/make up.
    (c) For the mirror B draw ray diagram for image formation for object distances 10 cm and 20 cm.