Class 10 Science · Chapter 9: Light: Reflection and Refraction

Worksheet · 20 marks · about 40 minutes · based on NCERT

Name _____ Class and section _____ Date _____

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1. Of the pole P, the principal focus F and the centre of curvature C of a concave mirror, the point that lies on the reflecting surface itself is [1]

(a) P only
(b) F only
(c) C only
(d) both F and C

2. A beam of light parallel to the principal axis falls on the convex mirror of a shop's security mirror. After reflection the rays [1]

(a) meet at a point in front of the mirror
(b) remain parallel to the principal axis
(c) travel back along their own paths
(d) appear to diverge from a point on the principal axis behind the mirror

3. Kavya holds a concave mirror facing the Sun and finds the sharpest bright spot of sunlight on a card 14 cm in front of the mirror. The radius of curvature of the mirror is about [1]

(a) 7 cm
(b) 14 cm
(c) 42 cm
(d) 28 cm

4. A ray of light strikes a plane mirror making an angle of 35° with the surface of the mirror. The angle of reflection is [1]

(a) 35°
(b) 55°
(c) 70°
(d) 110°

5. A dentist holds a small concave mirror close to a patient's tooth, nearer to the tooth than the mirror's focal length. The mirror is used this way because the image of the tooth is then [1]

(a) real, inverted and enlarged
(b) real, inverted and the same size
(c) virtual, erect and diminished
(d) virtual, erect and enlarged

6. State the two laws of reflection of light. Do these laws hold for reflection from a spherical mirror? [2]

7. A convex lens of power +5 D and a concave lens of power −3 D are placed in contact. Find the power and the focal length of the combination, and say whether it converges or diverges light. [2]

8. Farhan finds that a shaving mirror shows his face upright and enlarged when held close, but shows it inverted when he holds it at arm's length. Name the mirror and explain both observations. [2]

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9. A ray of light in air enters a transparent block. For this ray, the sine of the angle of incidence is 0.6 and the sine of the angle of refraction is 0.375. Find the refractive index of the block and the speed of light in it (speed of light in air 3×10^8 m/s). Is the block optically denser than crown glass, whose refractive index is 1.52? [3]

10. A convex mirror of focal length 30 cm is fixed at a blind turn in a hostel corridor. Tenzin, who is 180 cm tall, sees his image in it only 30 cm tall. How far is he from the mirror, and where is his image? [3]

11. Harpreet moves a toy figure towards a convex lens, from well beyond $2F_1$ to $2F_1$ and then to a point between F_1 and $2F_1$, catching the image on a screen each time. State the position and size of the image in each of the three cases. What stays the same about its nature? [3]