Light: Mirrors and Lenses

Standard difficulty · 20 questions · 40 marks · Time: 36 minutes

Name: _____ Date: _____ Score: ____ / 40

Show your working for Sections B and C. Answers are on the last page — try every question first!

Section A — Choose the correct answer 8 × 1 = 8 marks

1. A mirror whose reflecting surface curves inwards is a:
(a) plane mirror **(b)** convex lens **(c)** convex mirror **(d)** concave mirror

2. The image formed by a convex mirror is:
(a) always invisible **(b)** inverted
(c) erect and smaller **(d)** erect and enlarged

3. Which is used as a mirror at a sharp road bend?
(a) convex lens **(b)** concave mirror **(c)** convex mirror **(d)** concave lens

4. A ray strikes a plane mirror with an angle of incidence of 60°. What is the angle of reflection?
(a) 60° **(b)** 120° **(c)** 70° **(d)** 30°

5. A ray makes an angle of 35° with the surface of a plane mirror. What is the angle of incidence?
(a) 145° **(b)** 55° **(c)** 35° **(d)** 70°

6. The angle of incidence is 60°. What is the angle between the incident ray and the reflected ray?
(a) 150° **(b)** 60° **(c)** 30° **(d)** 120°

7. Which of these always gives an ERECT, SMALLER image?
(a) a convex lens held close **(b)** a magnifying glass
(c) a concave mirror held close **(d)** a concave lens

8. Which of these brings parallel rays of light TOGETHER?
(a) a torch reflector **(b)** a car side mirror
(c) a concave lens **(d)** a convex mirror

Section B — Short answer 8 × 2 = 16 marks

9. What is the difference between a concave and a convex mirror?

10. Which mirror or lens is used as (a) a mirror at a sharp road bend (b) a torch reflector?

11. A ray strikes a plane mirror with an angle of incidence of 85°. Find (a) the angle of reflection (b) the angle the reflected ray makes with the mirror.

12. A ray makes 40° with a plane mirror. What are the angles of incidence and reflection?

13. Describe the image formed by (a) a convex lens, object very close (b) a concave lens

14. Is the lens "convex" or "concave"? (a) can burn paper in sunlight (b) always gives a smaller, erect image

15. A ray falls on a mirror at 5° to the normal. The mirror is then turned so that the angle of incidence becomes 25°. What is the new angle between the incident and reflected rays?

16. Is it a "concave" or "convex" mirror? (a) the back of a shiny spoon (b) the inside of a shiny spoon

Section C — Word problems — 4 × 4 = 16 marks

17. Describe the images formed by a concave mirror as an object moves away from it.

18. A ray of light strikes a plane mirror at an angle of incidence of 65°. (a) What is the angle of reflection? (b) What angle does the reflected ray make with the mirror? (c) State the two laws of reflection. (d) Do the laws hold for curved mirrors?

19. Name the mirror or lens used in each and give a reason: a mirror at a sharp road bend; a solar cooker reflector; a dentist's mirror; a torch reflector.

20. A girl walks slowly towards (a) a concave lens and then (b) a concave mirror. Describe how her image changes in each, and give one use of each.

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Answer key

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Q	Answer	Working
1	**(d) concave mirror**	—
2	**(c) erect and smaller**	—
3	**(c) convex mirror**	—
4	**(a) 60°**	angle of reflection = angle of incidence
5	**(b) 55°**	measured from the normal: 90 − 35 = 55
6	**(d) 120°**	60 + 60 = 120
7	**(d) a concave lens**	—
8	**(a) a torch reflector**	—
9	**A concave mirror reflects from its inward-curved surface; a convex mirror from its outward-curved surface.**	—
10	**(a) convex mirror (b) concave mirror**	—
11	**(a) 85° (b) 5°**	(b) 90 − 85
12	**50° each**	90 − 40
13	**(a) erect and enlarged (b) erect and smaller**	—
14	**(a) convex (b) concave**	—
15	**50°**	2 × 25
16	**(a) convex (b) concave**	—
17	**Very close: erect and enlarged. As it moves farther, the image becomes inverted and enlarged, then inverted and smaller.**	—
18	**(a) 65° (b) 25° (c) The angle of incidence equals the angle of reflection; the incident ray, the normal and the reflected ray lie in the same plane. (d) Yes.**	—
19	**a mirror at a sharp road bend: convex mirror; a solar cooker reflector: concave mirror; a dentist's mirror: concave mirror; a torch reflector: concave mirror. Reasons: convex mirrors give a wide view; concave mirrors bring light together or enlarge; convex lenses magnify or focus.**	—

Q	Answer	Working
20	**(a) always erect and smaller (b) erect and enlarged when close, inverted when farther**	—