

Physics  
Worksheet: Mirror Problems

1. If the focal length of a concave mirror is 60 cm, what is the radius of curvature?
2. If an object is placed 50 cm in front of a concave mirror of 60 cm radius, where does the image form?
3. Given a spherical mirror whose radius of curvature is +20 cm. What is the focal length of this mirror? Does it form a real or virtual image?
4. A concave mirror of radius 60 cm is placed so that a luminous object is 20 cm in front of the mirror. Where does the image form?
5. A man 2.2 m tall stands 10 m in front of a convex mirror which has a radius of curvature of 5 m. How tall is the image?
6. What is the radius of curvature of a convex mirror which forms an image one fourth of the size of an object, when the object is placed 6 m in front of the mirror?
7. Where must an object be placed in front of a concave mirror of radius  $R$  in order for the image to be superimposed upon the object? Is this image real or virtual?
8. An ornamental silvered ball 6 cm in diameter forms an image of an object 2 m in front of the ball. Locate the image.
9. A 2.2 m tall man is standing 5 m in front of a plane mirror. Locate the image.
10. A man looks into a convex spherical mirror of radius 30 cm. If his face is 10 cm from the vertex of the mirror, where is his image located? What is the magnification?
11. The radius of curvature of a convex mirror is 30 cm, what is its focal length?
12. A 3 cm object is placed in front of a concave mirror and the image formed is 9 cm in height. What is the magnification of this object? In general terms where was the object placed (beyond  $C$ , at  $C$ , between  $C$  and  $F$ , or between  $F$  and the mirror)?
13. A convex mirror has a radius of curvature of 60 cm. If a 2.2 m tall object is placed 4 m in front of the mirror. Where is the image located and how tall is it?
14. An image is formed 20 cm from a convex mirror of radius 30 cm. Where was the object placed?
15. An object 0.1 m tall is placed 0.4 m from a convex mirror with a focal length of 0.3 m. What is the height of the image?
16. An object 0.5 m tall is placed 0.9 m from a convex mirror. An image is formed 0.7 m from the mirror. What is the focal length of the mirror?
17. An object is placed 37.5 cm in front of a concave mirror with a radius of curvature of 75 cm, where is the image formed?

18. An object is located 45 cm in front of a convex mirror which has a radius of curvature of 20 cm. What is the magnification?
19. An object is located 30 cm in front of a concave mirror which has a focal length of 40 cm. What is the magnification?
20. An object is placed 1.2 m from a concave mirror with a radius of curvature of 60 cm. What is the image distance?
21. A concave mirror is designed to have a magnification of 4 when an object is placed 60 cm in front of it. What is the radius of curvature of the mirror?
22. A woman looks at herself in a magnifying converging mirror whose focal length is 20 cm. If her face is 10 cm from the mirror, where is her image located? What is the magnification?
23. A child looks at his reflection in a spherical Christmas tree ornament 8 cm in diameter, and sees that the image of his face is reduced by one-half. How far is his face from the ornament?
24. A converging mirror has a focal length of 15 cm. Where would you place an object in order to produce an upright, virtual image twice as tall as the object?
25. A 2 cm high candle is placed 15 cm in front of a converging mirror with a focal length of 30 cm. How far "behind" the mirror does the candle appear, and how large is it?

Answers to Odds:

1. 1.2 m
3. 10 cm, either
5. 0.44 m
7. R, real
9. 5 m
11. -15 cm
13. -0.279 m, 0.152 m
15. 0.0428 m
17. infinity (no image is formed)
19. 4
21. 160 cm
23. 2 cm
25. -30 cm, 4 cm