GEOMETRICAL OPTICS.

16. In a double-convex lens of crown glass the radii of curvature are 3 and 4 inches respectively; find its focal length when used under water.

11. The primary lens of a compound has a focal length of 20 inches, and receives rays from a point 12 feet distant; determine the secondary which, being placed at a distance of two feet from the primary, n.ay have the resultant focus two inches behind itself.

12. A convex lens is placed at a distance of 2 feet from an object 1 inch long, and the image is found to be $2 \cdot 25$ inches in length; determine the focal length of the lens.

13. An object 5 inches in diameter is placed 18 inches in front of a convex lens of 7 inches focal length; find the position and size of the image.

14. Compare the size of the image with that of the object in Problem 11.

15. Find the dispersion in a lens of crown glass 3 feet in focal length, and 4 inches in diameter.

16. Determine the distance between the focus for red rays and that for violet ones in the lens of Problem 15.

17. Determine the constituents of an achromatic prism of water and sulphide of carbon, when causing a deviation of 5°.

18. The first face of a fint glass lens has r = 12 inches; what must be the radius of curvature of the second face to achromatize a convex crown glass lens of 3 feet focal length?

19. A simple microscope consists of two lenses, the first being 1 inch focal length, and the second 2 inches. What must be their distance apart in order to be achromatic when viewing an object 6 inches from the first lens?

20. A lamp is placed 6 inches from a plane wall. At a point on the wall 12 inches from the lamp compare the illumination with the greatest received by any point on the wall.

21. The least distance at which a person can see distinctly is 45 inches; determine the lens he should use.

22. In viewing a small object with a convex lens of 1 inch focus, the lens is one-half inch from the eye, and seven-eighths of an inch from the object. Determine the magnifying power under these conditions.

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