

Paraxial Properties Measurement

PP-1

A Geneva gauge calibrated for a refractive index of 1.523 is used to measure the curvature of a lens having a refractive index of 1.5. The distance between the two end pins on the Geneva gauge is 2 cm. The Gauge measures a power of 2 diopters. How many microns of sag is the Geneva gauge measuring?

PP-2

I have a 6 inch diameter, approximately 24 inch focal length lens, and I want to measure the back focal length and focal length to an accuracy of 0.001 inches. Give a method for performing the measurement. Justify whether the desired accuracy can be obtained or not.

PP-3

Given the measured total object-to-image distance and measured image magnification for two different object-to-lens distances, derive a formula for the focal length of a thick lens under test. How is this test similar to that using reciprocal magnification? What additional information is needed to obtain both focal length of the lens and principal plane locations?

PP-4

The focal length of a thick lens is measured using the reciprocal magnification technique. For the first position of the lens the magnitude of the magnification is 2. The distance between the first position of the lens and the second position of the lens is 10 cm. What is the focal length of the lens?

PP-5

A focal collimator with an Fo/A of 1000 is used to measure the focal length of a lens. The image of the reticle is measured to be 2 ± 0.01 mm.

- a) Sketch the focal collimator.
 - b) What is the focal length of the lens?
 - c) Briefly describe how you would use the focal collimator to measure all the cardinal points of the lens.
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PP-6

A focometer is used to measure the power of a thin lens. What is the location of the lens being tested so the distance the target must be moved to restore focus is linearly proportional to the power of the lens being measured?