

Physics 216: Postlab 6: Lenses and images.

1. Nearly all reflecting telescopes have a concave spherical mirror and a secondary mirror (usually flat) to redirect the light. The secondary mirror is in the path of the incoming light. (See the ray diagrams about ½ way down at this site https://en.wikipedia.org/wiki/Reflecting_telescope for an example). Why doesn't this block part of the image? (HINT: it has nothing to do with the optical elements being mirrors).
2. In lab we did the exercise where an object and screen were separated by somewhat more than four times the focal length of a converging lens. For $f=10$ cm and a separation "d" of 50 cm show that there are two solutions (two lens positions that make an image) as follows:
 - a. Since $s+s'=d$, rewrite the thin lens formula in terms of s , d , and f only (that is, eliminate s')
 - b. Since one side of the thin lens equation is a constant ($1/f$) and the other side depends only on s , we can solve this equation graphically by plotting the s -dependent side of the equation vs s and note where it is equal to $1/f$. At these values of s , the two sides of the equation are the same and these represent solutions to the equation. Use Excel or some other graphing program (no hand graphs allowed) to do this and find the two solutions (values of s). Include your graph and explain how you got your answers from it.