Answer on Question #43536, Physics, Optics

A combination of a converging and a diverging lens forms a real image of an object. How will the position of the image change when the positions of the two lenses are interchanged? Which of the lenses is of greater power?

Solution

If you look at formula for combined system of two lenses, you will not that focal lengthes of both lenses are included symmetrically.

$$\frac{1}{f_{eff}} = \frac{1}{f_1} + \frac{1}{f_2} - \frac{l}{f_1 f_2}$$

$$f_{eff} = \frac{1}{\frac{1}{f_1} + \frac{1}{f_2} - \frac{l}{f_1 f_2}}$$

(f_1, f_2 are focal lengthes of the 1 and lens and l is distance between them) This means, that there is no difference, what lens is first. So, image will not change when the positions of the two lenses are interchanged. From the same formula you will not that f_1 should be smaller if we want real image, hence, converging must be greater power.