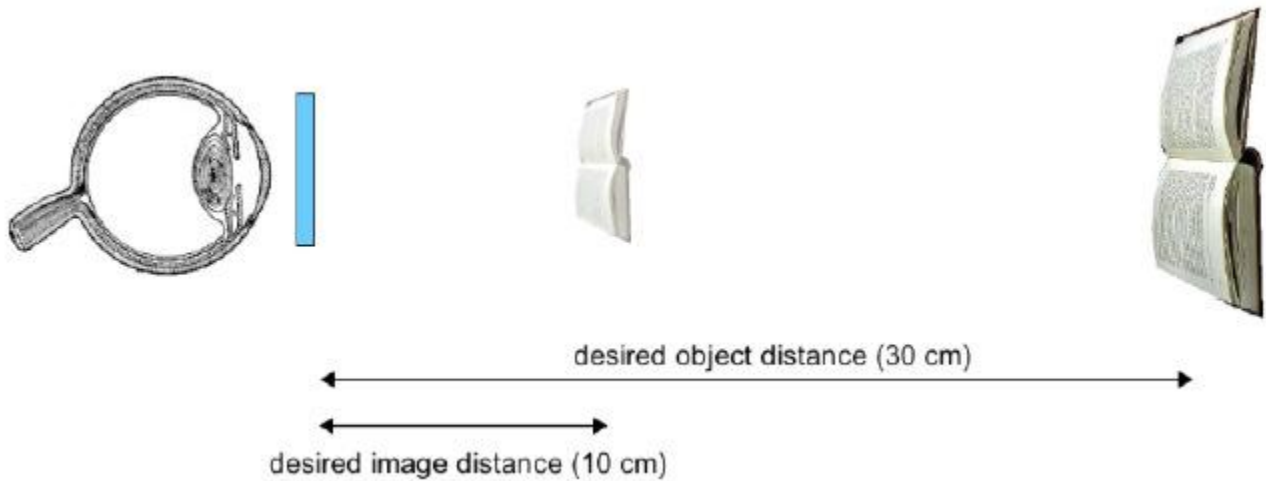


Choosing a lens

An optician's nearsighted patient would like to be able to read a book without having to hold the book close to his face. If a natural distance to hold the book away from your eye is 30 cm, and the patient has to hold the book at 10 cm to read it comfortably, the optician wants to design a lens that will make an object that is 30 cm away appear to be only 10 cm away to the patient as shown in the figure below.



- The optician wants the image to be right-side up and on the same side of the lens as the object. Should he use a converging lens or a diverging lens? Explain your reasoning.
- The picture shows the image as smaller than the object. Is this correct? If the distances are as shown, what will be the magnification factor (ratio of the image size to object size)?
- What is the focal length of the lens the optician needs to use to get the desired result?