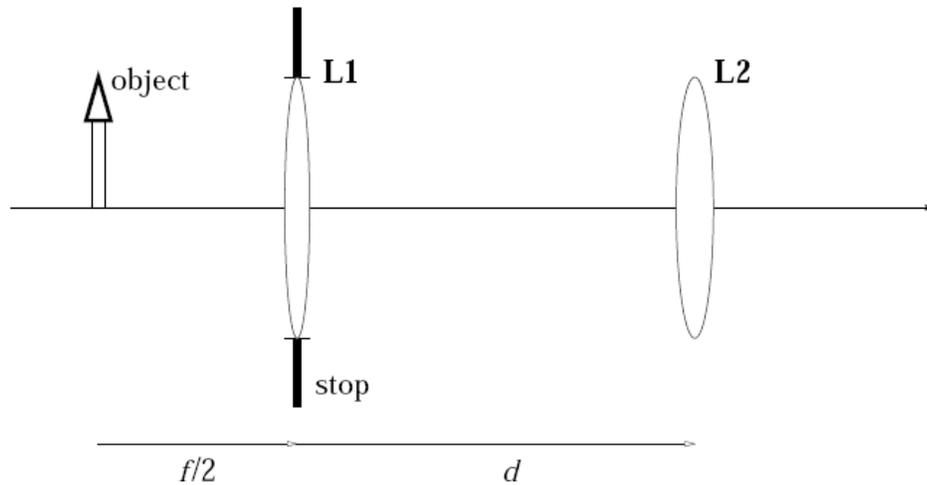


1. Consider the two-lens system shown below. Lens L1 has focal length  $f$ , and lens L2 has focal length  $f/2$ .
  - (a) Set the separation distance  $d$  such that the Effective Focal Length (EFL) of the combination equals  $f$ .
  - (b) Locate the principal planes.
  - (c) Locate the image plane.
  - (d) What are the lateral and angular magnifications?



2. It is found that sunlight is focused to a spot 29.6 cm from the back face of a thick lens, which has principal planes  $P_1$  at +0.2 cm to the front face and  $P_2$  at -0.4 cm to the back face. Determine the location of the image of a candle that is placed 49.8 cm in front of the lens.
3. Show that one of the principle planes of a plano-convex or plano-concave lens is tangential to the curved surface.
4. A compound lens consists of a thin positive lens of power +2.5D followed by an interval of 20 cm followed by a thin negative lens of power -2.5D. Locate the principal planes and determine the EFL, BFL, and FFL.
5. An object is placed 200 cm to the left of the first lens of problem 4. Where does the image form and what is the lateral magnification?

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