An object is placed 3 centimeters to the left of a convex (converging) lens of focal length \( f = 2 \) centimeters, as shown below.

\[ f = +2 \text{ cm} \]

(a) Sketch a ray diagram on the figure above to construct the image. It may be helpful to use a straight-edge such as the edge of the green insert in your construction.

(b) Determine the ratio of image size to object size.

The converging lens is removed and a concave (diverging) lens of focal length \( f = -3 \) centimeters is placed as shown below.

\[ f = -3 \text{ cm} \]

(c) Sketch a ray diagram on the figure above to construct the image.

(d) Calculate the distance of this image from the lens.

(e) State whether the image is real or virtual.

The two lenses and the object are then placed as shown below.

\[ f = +2 \text{ cm} \quad f = -3 \text{ cm} \]

(f) Construct a complete ray diagram to show the final position of the image produced by the two-lens system.