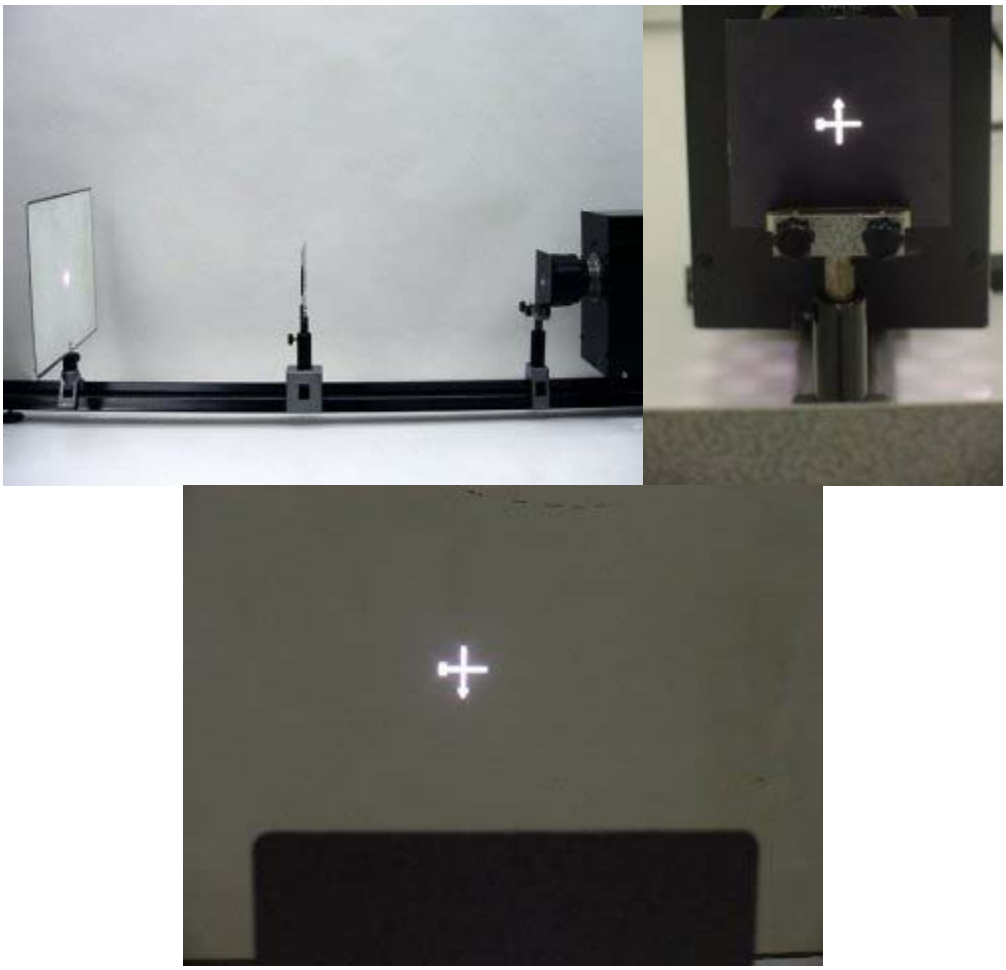
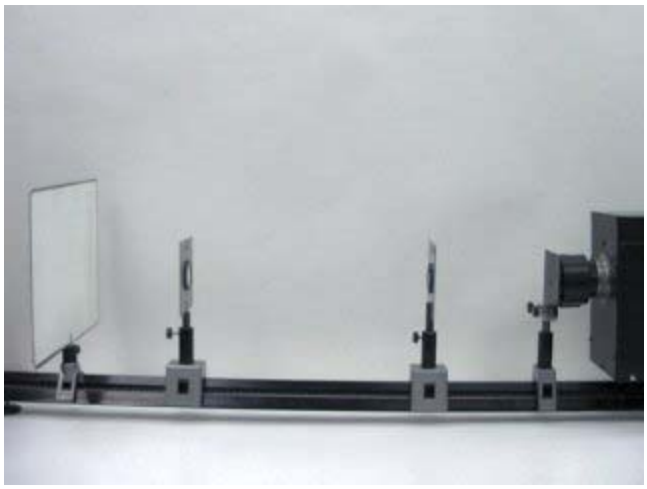
Question #335

Shown in the photograph at the left below is an optical system consisting of a source with an object cross, a 20cm focal length convex lens located 40 cm from the source, and a screen located 40 cm from the lens. A close-up of the object is seen in the photograph at the center, and a close-up of the image in the photograph at the right. Note that you can see the top of the lens at the bottom of the object and the image photographs. Note that the camera taking the picture of the image in this case had to be turned around from its position viewing the object. So I guess that would make the image for this system "inverted" in both directions transverse to the optic axis (The ends of the image point in the opposite directions to that of the object.).

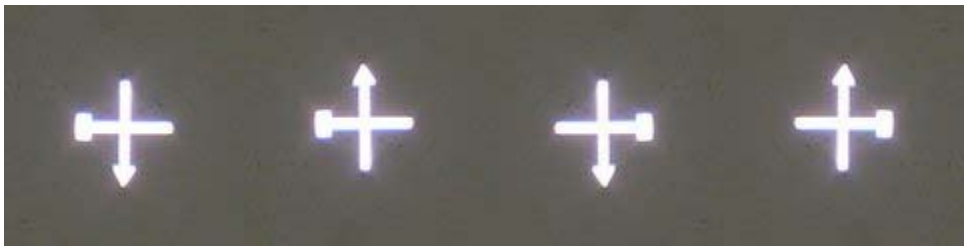


Nothing particularly surprising thus far, I presume.

Now, rather than a single lens separated from the object and the image by twice its focal length, let us place two lenses, each identical to the 20cm focal length convex lens above, at a distance of 20 cm from the object and the image respectively, as seen in the photograph below.



The question this week is what the image will look like. Below are four figures showing different ways the image might appear.



You are to select from the above "looks" which most closely approximates the look of the actual image.

- (a) a.
- (b) b.
- (c) c.
- (d) d.

Oh yes, you must also specifiy whether the image is real or virtual, and upright or inverted, and determine its magnification.

You might be able to do this by drawing light rays. If you wish, you may indulge in object/image calculations to verify your results. We will include both in our solution.

Click here for Answer #335 after February 9, 2009.

Question of the Week

Outreach Index Page

Lecture-Demonstration Home Page

For questions and comments regarding the *Question of the Week* contact Dr. Richard E. Berg by e-mail or using phone number or regular mail address given on the Lecture-Demonstration Home Page.