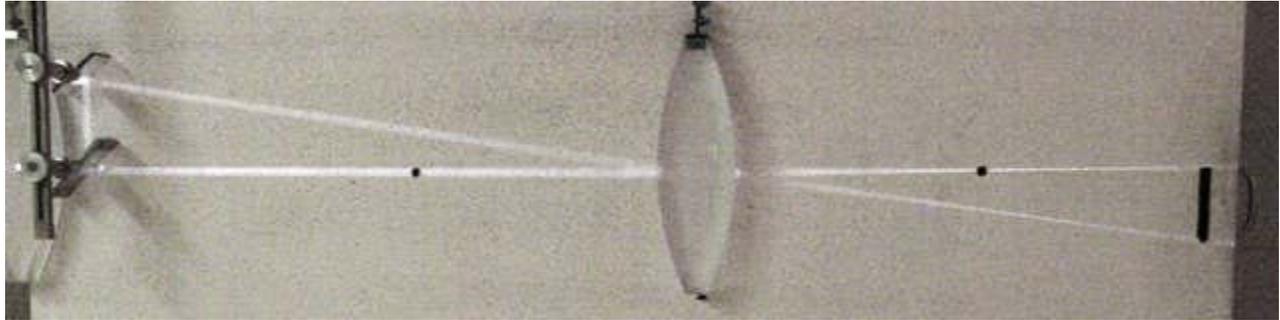


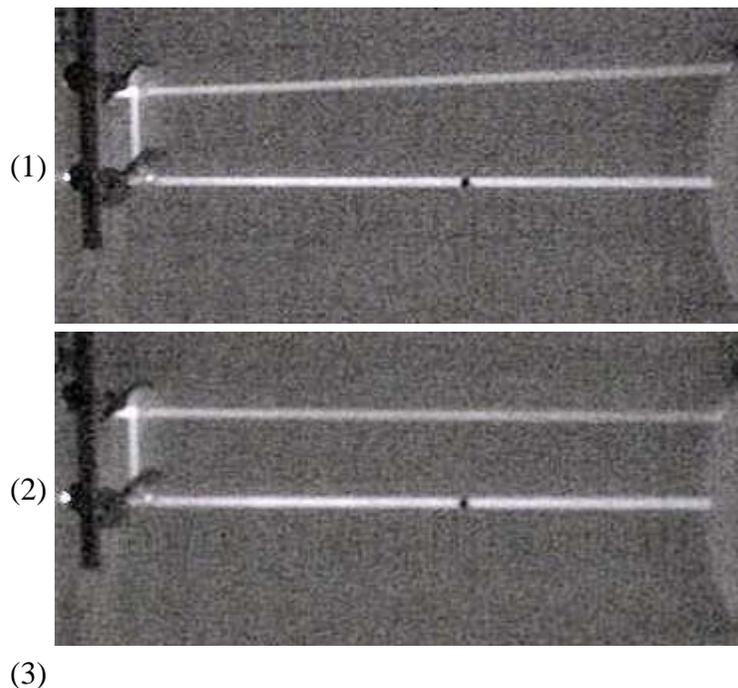
## Question #219

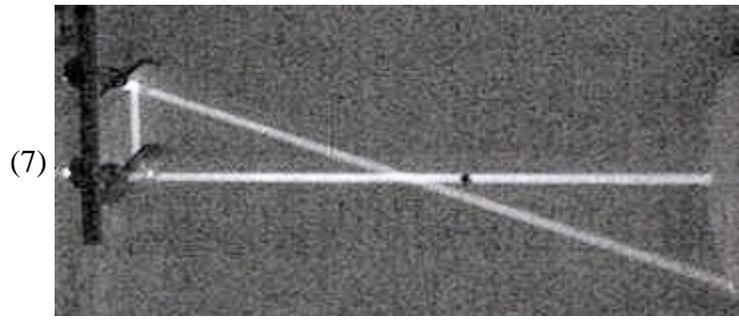
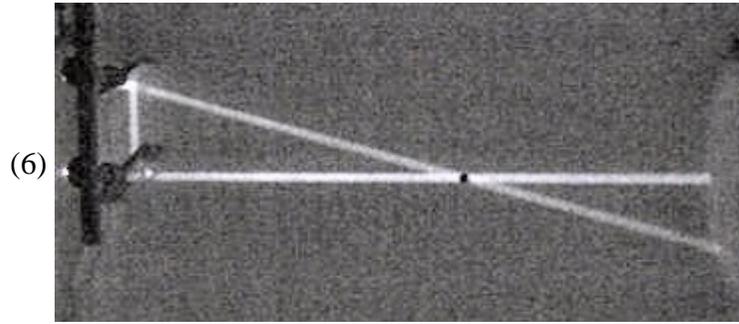
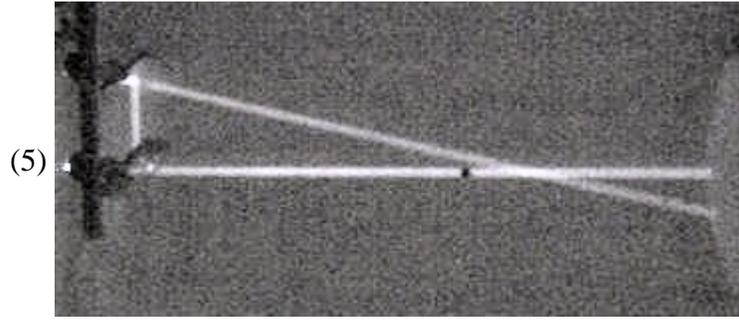
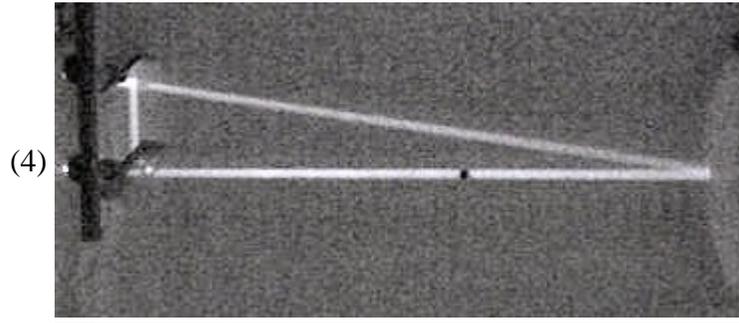
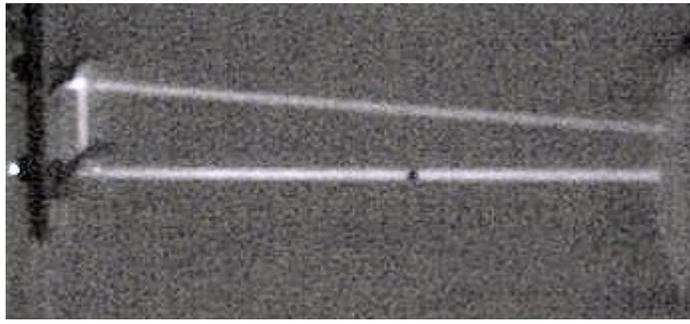
This question involves the paths that various light rays take as they travel from the tip of an object to the location of the image on the large optical board of the University of Maryland Physics Lecture-Demonstration Facility. We will focus the rays with the convex lens shown in the photograph below.



The object is the bright vertical line between the two angled mirrors at the left of the photograph. A single narrow slit is placed in front of a bright light source to the left of the picture. A half-silvered lens allows a line of light to follow the optic axis of the system while reflecting part of the light up to a second (full-silvered) mirror, which can be rotated so that it creates a second ray aimed toward the right at various angles. The particular ray seen in the photograph then begins at the tip of the object, passes symmetrically through the lens and then through the tip of the image, marked by a strip of black tape at the right of the optical board. The focal points of the lens are marked by black dots.

Several additional rays can be created by rotating the upper mirror, as seen in the seven photographs below, marked (1) through (7).





Question: the question this week is where each of these rays will be (how far from the optic axis) when they reach the location of the image (the black tape arrow at the right). Select one of the following to describe where each of the above rays will be located when it arrives at the far right of the board at the image position.

- (a) This ray will leave bottom of the picture before reaching the image.
- (b) This ray will be further from the optic axis than the tip of the image.
- (c) This ray will be exactly at the tip of the image.
- (d) This ray will be closer to the optic axis than the tip of the image.
- (e) This ray will be above the optic axis but still in the picture.
- (f) This ray will leave the top of the picture before reaching the image location.

Click here for [Answer #219](#) after May 2, 2005.

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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](#).