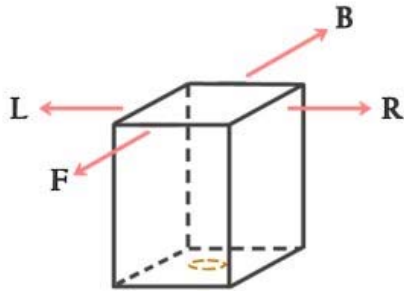
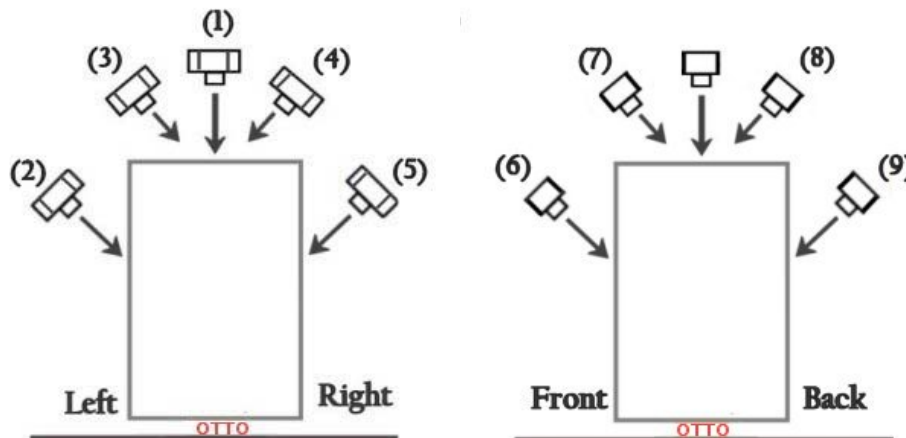


Question #297

We have not heard from OTTO recently ([Q#97](#), [Q#99](#), [Q#102](#), [Q#105](#), [Q#108](#), [Q#114](#), [Q#124](#), [Q#279](#)), but here he is again, that sneaky fellow, "hidden" under a block of clear plastic, as seen in the photographs below. The plastic block is square, with a height slightly larger than the length of one side of the square. If you look directly down on the top of the plexiglass block you see OTTO, as pictured at the right below. To set up our coordinate system for the problem we will refer to the directions with respect to the top view below: front (F), back (B), left (L), and right (R).

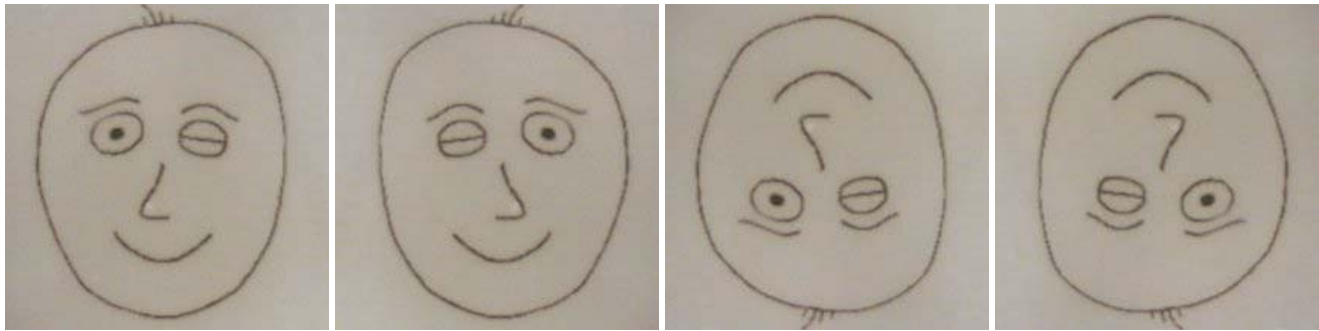


There are a number of ways that you can look at the plexiglass block to view OTTO, other than from directly above. Some of these ways are indicated in the two drawings below, which show front and side views of the plexiglass block and the camera as it is approximately positioned for each view. Looking straight down through the plexiglass block on OTTO is view (1).



For example, you might look through the top of the plexiglass block toward the inside surface on the opposite side of the camera from you to see an internal reflection of OTTO, labeled as views (3) and (4) in the left-right plane and views (7) and (8) in the front-back plane. Or you might look through any one of the four sides of the block to see refracted views, labeled as views (2) and (5) in the left-right plane and views (6) and (9) in the front-back plane.

All this viewing will be done by our camera, sketched in the drawings above. (Note that in the front-to-back view the camera appears rotated from its orientation in the left-to-right view.) In all cases, if the plexiglass block were to be removed, the view of OTTO would be very similar to the photo above, which is detailed below as (a), with the top of his head pointing *upward* in the photograph. On the other hand, the view of OTTO may look rather different from various locations, such as one of the other three *looks*, labeled (b), (c), and (d). Or you *may not even be able to see* OTTO looking in the way described, which might be called look (e).



(a)

(b)

(c)

(d)

Your problem this week is to select from the five choices, (a) through (e), presented above as to which one looks more like OTTO as seen from the specific location. You may of course adjust the position and/or the angle slightly in each case, to find the best position for viewing OTTO from that general location.

When viewed from each of the labeled points above: (1), (2), (3), (4), (5), (6), (7), (8), and (9), OTTO will look more like:

- (a) OTTO look (a).
- (b) OTTO look (b).
- (c) OTTO look (c).
- (d) OTTO look (d).
- (e) OTTO cannot be seen from this position, look (e).

Click here for [Answer #297](#) after November 19, 2007.

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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](#).