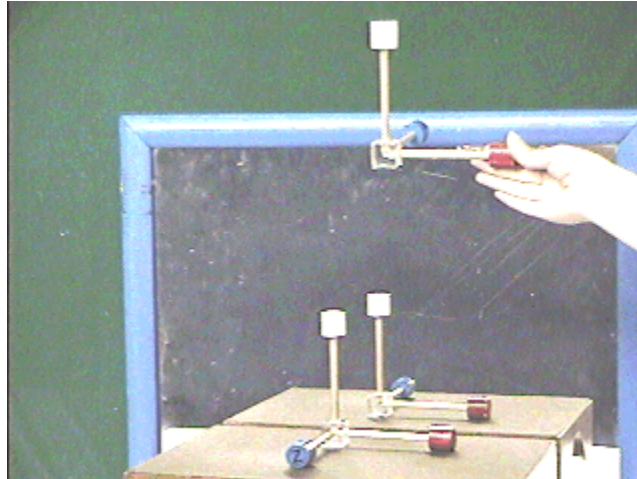


## Answer #18

The answer is (c); your image in a plane mirror is inverted front-to-back, and in no other direction. We can see this by observing the reflection of a set of axes in the mirror, as seen below.



In the photograph we see a standard set of cartesian coordinate axes, with x (red) pointing to the right, y (white) pointing up, and z (blue) pointing outward away from the mirror. Notice that in the reflection the x and the y axes are both pointing in the same directions as in the flesh (actually wood), but the z axis points *into* the mirror - in the opposite direction - an optical inversion. This is verified by comparison of the reflected axes with a second set of axes held above the mirror - note that this second set of axes has the z-axis pointed in the opposite direction from the original set.

This is somewhat counterintuitive, because we have grown accustomed to comparing our mirror image with what we see when we actually confront someone in the flesh; our image seems "inverted" in the left-right direction in this case. Note that in meeting someone face-to-face the two must be facing opposite directions. In the same way, if your image in a plane mirror were not inverted front-to-back you would see your *back* when you looked at yourself in a mirror!

As can be noticed in the photograph below, Gwen feels much better about understanding her image.



In the world of physics this type of image is known as (yes, really) a *perverted image*.

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