HW4:

1. Watch the directions of axes when drawing projections on a specified plane from a specified direction. This is important so that standard trigonometric functions and the cross product have sign properties consistant each other. The following relationship between the axes is the standard for the right-handed coordinate system:

   Looking from the direction of the positive z axis (toward the negative z axis), the direction of the y axis is 90° **counterclockwise**, i.e., **positive** away from the direction of the x axis.

2. In 3D, an angle is always formed from two sides in the same plane. The projection of the angle into a different plane is the angle between the projections of the sides. The magnitude of that projection will be different, always smaller, except if the projection plane is parallel to the sides.

   The textbook and homework diagrams must show the angles or their projections in particular planes in order to relate the angles to the lenghs of triangle sides.

3. re. items 18-19: Several people did everything OK except they multiplied the matrices in the wrong order during step 18. Of course, the checking of step 19 then failed.

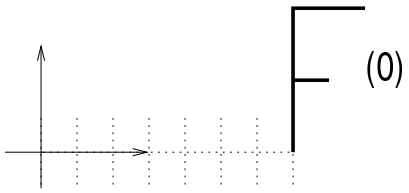
   Make sure you *know* how the order of matrix multiplication corresponds to the effective order in which the transformations are applied!

Blender material on exams: Some exam questions will be based on the lessons I assigned on handouts. I will try to avoid hot-key memorization questions, but the questions will be based on the assumption that you understood the lessons.

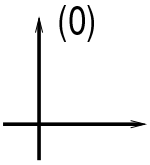
The reason the results come out the same no matter what order you use to edit the transformation properties values is that the object transformation is the result of composing the transformations corresponding to each property in a particular order. Specifically, the x rotation is done first, then the y rotation, and then the z rotation.

Turn Page over ...

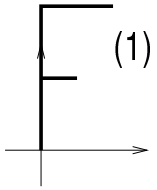
HW5, question 1: Most people got the 2nd half wrong...It's tricky! The first half was to trace the action of successive applications of the sequence of transformations on the model. The second half was to draw the successive new coordinate systems defined by multiplying on the right the sequence in the reverse order (which is what OpenGL `glMultMatrix`, etc. does.)



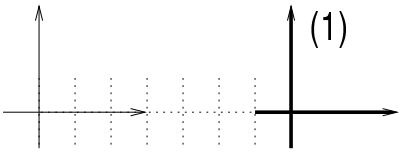
mF



orig. coord. system.



$T_{-d}\,mF$



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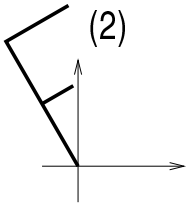

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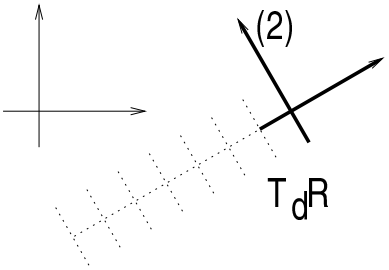
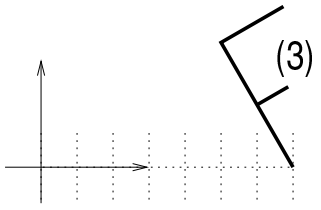


T_dR



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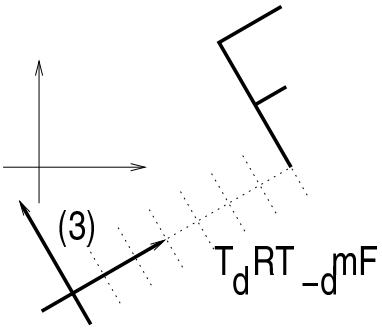

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