Rotate around axis

This command represents the most general rotation. The user can rotate a shape around an axis, at a specific angle. We can add more rotate commands by creating particular examples from this rotation. A 2D rotation can be done by replacing the axis with the current plane's Z axis. A command like this will be available soon enough.

Rotate around axis works like this:

The user selects a shape

The user selects an axis

A slider appears in order to choose the desired rotation angle

Let's not forget that every shape has a pivot. The pivot is set as the shape's base point (as default). But it can be changed whenever the user wants to do so. If the pivot is set to represent the center of the shape, or a specific point of interest, it must remain in the same place after rotating the object. By "place", I mean the reference to the object, not to the current plane or the global axis system. This means that rotate around axis is not that easy as it seems. The most important steps are:

-rotate the object: this operation only rotates the shape; it has nothing to do with its base point or any other coordinates.

-the second step is to calculate the resulting base point. This is not as hard as it seems, because every object has a base point. This means that it is enough to apply the same rotation to the vector that represents the base point (the vector that starts from the system's origin and ends with the base point).

-the most difficult part is to move the pivot. Do we have to apply the same rotation to the pivot? Or do we need to copy the vector given by the base point and the pivot to the final base point? The correct answer is to rotate the pivot with the same rotation. Copying the vector mentioned above to the final base point will not rotate the shape itself, but only its position. This would actually work like a translate operation, by copying the object from one point to another.

The slider might not offer good precision when we look at it the first time, because it is usually impossible to get the desired angle by moving the slider. To fix this, we allow the user to type the desired value in the text box and hit the "Ok" button. This way, we combine animation with precision.