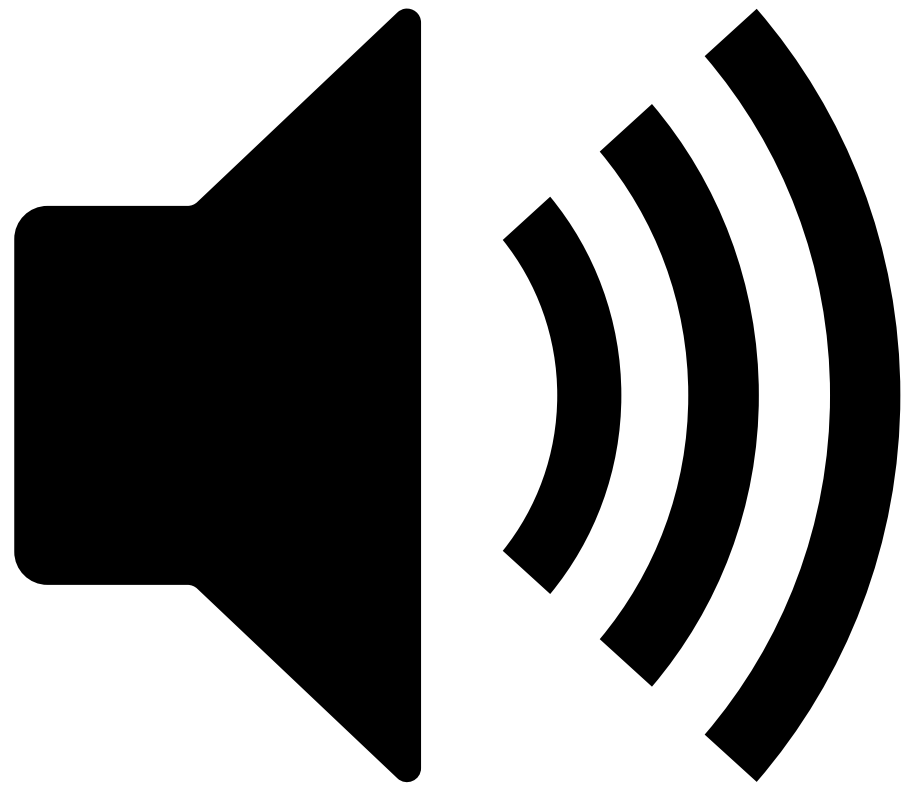
Scaling

Affine spaces don’t have the concept of a single origin, in fact, it is a different kind of coordinate system in itself. Instead, they are associated to the bounds of the planes and its length or ratio. For this session, you can understand them as any transformations that retain parallelism.

In the first transformation, that is scaling, you will no longer retain the size of the object, but the form would remain intact.

This transformation can be calculated by just multiplying the scaling factor to each of the point in your object.

If your scaling factor is same for both x and y axes, then your scaling may be referred to as Isometric scaling.



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Shearing

In Shearing, each point in a geometry is translated in one direction but the magnitude of translation for each of the point is proportional to the amount of distance from a line that is parallel to that direction.

This is not an example of rigid transformation as the geometry is not preserved unlike other transformation we saw before.

For shearing, that will happen along x-axis, the non-parallel or lines adjacent to parallel lines to x-axis would be moved towards a new line with slope 1/m. m will be inverse of tangent of the angle theta of shearing.