

**Files:** The accompanying file for this assignments is `assignment1.html`.

**Delivery:** upload the modified HTML file and any other necessary files to the Racó. All explanations and/or answers to the problems should be included in the HTML file.

**Problem 1.**

Implement the following 2-dimensional transformations and apply them to the polygonal object in `points`.

1. Translation.
2. Rotation around the origin.
3. Scaling by  $(\lambda_1, \lambda_2)$  with respect to the origin.
4. Reflection with respect to the  $x$ -axis.

**Problem 2.**

Implement compositions of 2-dimensional transformations and apply them to the polygonal object in `points`.

1. Composition of translation and rotation.
2. Composition of rotation and translation.
3. Reflection with respect to a given line.

**Problem 3.**

Implement the following projections in 2D and apply them to the polygonal object in `points`.

1. Parallel projection.
2. Central projection.

**Problem 4.**

Determine which of the projections implemented in Problem 3 preserve affine combinations. Illustrate that in your program. For example, by showing the same point in the original and projected space, and showing the corresponding coordinates.