RIGID MOTIONS OF THE PLANE

LECTURE 1, EXERCISE SET 1

Definition 1. A rigid motion of the plane (or an isometry) is a motion which preserves distance.

There are four basic rigid motions:
(1) Reflection
(2) Glide Reflection
(3) Rotation
(4) Translation

Theorem 2. The above list contains all rigid motions of the plane.

Exercise 3. Describe compositions of the following motions as one of the motions from the list above.
(1) Rotation by $\alpha$ around the origin followed by rotation by $\beta$ around the origin.
(2) Translation by the vector $(a, b)$ followed by translation by the vector $(c, d)$.
(3) Reflection through a line $l_1$ followed by reflection through a line $l_2$.
(4) Translation by $(1, 1)$ followed by rotation by $90^\circ$.
(5) Rotation by $90^\circ$ followed by translation by $(1, 1)$.
(6) Rotation by $90^\circ$ counter clockwise around the origin followed by rotation by $90^\circ$ clockwise around the point with coordinates $(2, 0)$.

\[\text{Date: July 9.}\]