

MAT 150A, Fall 2023  
Homework 7

**Due before 2:10 on Friday, December 1**

*Please write the homework solutions in connected sentences and explain your work. Mark the answers to each question. Scan or take pictures of your homework and upload it to Gradescope before due time.*

1. Recall that any isometry of the plane can be written as

$$m(x) = Ax + b$$

where  $A$  is an orthogonal matrix and  $b$  is a fixed vector. Assume that  $\det(A) = -1$ , so  $m$  reverses orientation. Prove that  $m^2$  is a translation by some vector.

In problems 2-4, find all isometries of the following infinite patterns:

2. ...  $\perp$   $\perp$   $\perp$   $\perp$   $\perp$   $\perp$   $\perp$  ...

3. ...  $\triangleleft$   $\triangleleft$   $\triangleleft$   $\triangleleft$   $\triangleleft$   $\triangleleft$   $\triangleleft$  ...

4. ...  $\triangleleft$   $\triangleright$   $\triangleleft$   $\triangleright$   $\triangleleft$   $\triangleright$   $\triangleleft$  ...