For each of the following five shapes in $\mathbb{R}^2$:

a. Name every isometry (without writing explicitly).

b. Classify each isometry as identity or rotation (which angle?) or reflection in a line (which line?).

c. For every pair of isometries $f, g$, determine the composed isometry $g \circ f$. It should be on your list! Make a table.

d. For every pair of isometries $f, g$, determine whether or not they commute (i.e. $g \circ f = f \circ g$).

1. A is a scalene triangle.

2. B is an isosceles (but not equilateral) triangle.

3. C is an equilateral triangle.

4. D is a rectangle (but not a square).

5. E is a square.

6. Find a finite shape $F$ in $\mathbb{R}^3$ and an isometry of $F$ that is NOT an identity, rotation, reflection, or inversion. Hint: improper rotation.