

## PROBLEM SET 1

TOPICS IN MANIFOLDS, SPRING 2016

- Problem 1.** Show that any isometry of  $\mathbb{R}^3$  is the product of one, two, three, or four reflections.
- Problem 2.** Show that the angular excess is additive for a spherical or hyperbolic polygon (see Exercises 1.6.1 – 1.6.3 from Stillwell).
- Problem 3.** Classify the isometries of the twisted cylinder (see Exercise 2.3.3 from Stillwell).
- Problem 4.** Classify the isometries of the torus (see Exercises 2.4.2 – 2.4.3 from Stillwell).