INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH MOHALI

MTH101 (Symmetry)

Tutorial Sheet 01 / January 11, 2022 Spring 2022

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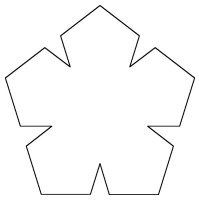
1. Determine symmetries of the following shapes. Write their composition tables.

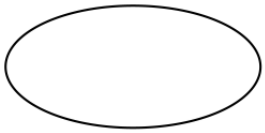
   (a) Equilateral triangle.

   (b) Square.

   (c) Five petaled flower. (If you find this composition table too large, do as much as you can!)



   (d) Ellipse. (This should be easier!)



2. Using the symmetries of an equilateral triangle, obtain the following composition rules for permutations.

   (a) (1 3)(1 2) = (1 2 3)

   (b) (1 3)(2 3) = (1 3 2)

   (c) (1 2)(2 3) = (2 3)(3 1)

   (d) (1 2 3)(1 3 2) = original configuration.

3. Write the composition table of symmetries of a rectangle in permutation notation.
