General Mathematics and Computational Science II

Exercise 8

February 27, 2007

1. (Ivanov, p. 39.) Recall that the symmetry group of a subset A of the plane is defined as

$$\mathrm{Sym}(A) = \{F \text{ motion} \colon F(A) = A\}\,.$$

   Prove that such a set of motions is indeed a group.

2. (Ivanov, p. 39.) Prove that the symmetry group of an equilateral triangle is isomorphic to the abstract group with two generators a and b of order 2 satisfying the additional relation $aba = bab$.

   Recall: A group element g is of order n if n is the smallest natural number such that $g^n = e$.

   Hint: Count the number of elements of this group.