General Mathematics and CPS II

Exercise 7

February 24, 2012

1. Use the matrix form of the equation for a reflection (see handout) to show that the composition of reflections about parallel lines is a translation $\Pi_{\boldsymbol{v}}$. Find an expression for the translation vector $\boldsymbol{v}$.

2. Let G be a group and let $a, b \in G$. Show that $(ab)^{-1} = b^{-1}\, a^{-1}$.

3. (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.