

## Quiz #1

### Problems:

1. (1pt) Give an example of two matrices  $A, B \in GL_2(\mathbb{R})$ , such that their product is not commutative, that means that  $AB \neq BA$ .
2. (1pt) List the elements of the group  $U_{15}$  of the units of the set  $\mathbb{Z}/15\mathbb{Z}$
3. (1 pt) Show that if  $G$  is a group with only 2 elements then there exists an isomorphism between  $G$  and  $\mathbb{Z}/2\mathbb{Z}$ .
4. (2pt) Let  $G$  be a group and let  $H$  be a subgroup of  $G$ . Let  $x$  be an element of  $G$ . Define  $xHx^{-1} := \{xhx^{-1} | h \in H\}$ . Prove that  $xHx^{-1}$  is a subgroup of  $G$ . (Be precise and do not forget steps!)