HW4 - Algebra - Fall 2018

Due date: Friday, Oct 12th.

0.1 Isomorphisms

Exercises 1, 2, 7, 8, 9, 34, 36, 41, 42 [Chapter 9]

0.2 Categorical extra-credit

Match the elements of the first list with elements of the second list, if possible. Strike out the assertions that are not true, that do not make sense, or that do not correspond to anything in the other list.

1. A morphism between two sets.

2. The kernel of a group contains the identity element.

3. A morphism between two linear spaces.

4. The image of a linear map is a subspace.

5. An isomorphism between two sets.

6. The domain of definition of a function.

7. The intersection of two linear subspaces is a linear subspace.

$$\star\,\star\,\star$$

a. The image of a group morphism is a subgroup.

b. A linear map.

c. A map.

d. A bijective map.

e. The nullspace of a linear map contains 0.

f. The union of two subgroups is always a group.

g. The domain of definition of a group morphism.