

Problems and Comments for Section 6

Problems: 6.1, 6.2, 6.5, 6.8

Comments: In mathematics everything should be a set. An ordered pair (a, b) is not a set. It should be something different from the set consisting of a and b . We have $\{a, b\} = \{b, a\}$ but $(a, b) \neq (b, a)$ unless $a = b$. The Kuratowski definition of an ordered pair is:

$$(a, b) = \{\{a\}, \{a, b\}\}$$

You may try to prove the following

Proposition $(a, b) = (c, d)$ if and only if $a = c$ and $b = d$.

Notice that in Kuratowski's definition of an ordered pair (a, b) , the first component is the only element of the singleton $\{a\}$ in (a, b) while the second component is either also a or the element b in $\{a, b\}$ if b is different from a .