

Reading Quiz §9

Key

1. [1] A relation R on S is an equivalence relation if it satisfies three properties. Name or describe one of the properties R must satisfy.

Reflexive: xRx

Symmetric: if xRy , then yRx

Transitive: if xRy and yRz , then xRz .

2. (a) [1] Provide a nontrivial example of an equivalence relation on the integers, \mathbb{Z} .

xRy if $x=y \pmod{5}$

or said another way

if $x-y = 0 \pmod{5}$

$x-y \in 5\mathbb{Z}$ where $5\mathbb{Z}$ is the subgroup in \mathbb{Z}

- (b) [1] Identify a representative to one of the equivalence classes that result from the above equivalence relation you defined.

one equivalence class: $\bar{1}$ or $\bar{6}$ or $\bar{11}$...

another class: $\bar{3}$ or $\bar{8}$ or $\bar{13}$...

3. [2] Let H be a subgroup of G . Explain in your own words/with an example what a right coset of H in G is.

Let $a \in G$, then $Ha = \{ha \mid h \in H\}$ is a right coset of H .