



Name-Surname:

06.11.2014

ID Number:

CLASSWORK 4

Define a relation R on \mathbb{Z} such that $(m, n) \in R$ if $m + n$ is even. Is this relation

- a) Reflexive?
- b) Symmetric?
- c) Antisymmetric?
- d) Transitive?

Answer:

- a) YES. $m + m$ is always even.
- b) YES. If $m + n$ is even, then $n + m$ is even.
- c) NO. For example $(1, 3) \in R$ and $(3, 1) \in R$.
- d) YES. Suppose $(k, m) \in R$ and $(m, n) \in R$. If k is odd, both m and n are odd, therefore $(m, n) \in R$. Similarly for k even.



Name-Surname:

06.11.2014

ID Number:

CLASSWORK 4

Let $A = \{1, 2, 3, \dots, 40\}$ and $B = \{1, 2, 3, \dots, 80\}$.

- How many functions are there from A to B ?
- How many one-to-one functions are there from A to B ?
- How many one-to-one functions are there from A to B satisfying the condition that odd numbers are mapped to odd numbers and even numbers are mapped to even numbers?

Answer:

a) 80^{40}

b) $\frac{80!}{40!}$

c) $\frac{40!}{20!} \cdot \frac{40!}{20!}$