MATH310 Groupwork 2022-07-28

NAME:

1. Define $A = \{1, 2, 3, 4\}$ and $B = \{x, y, z, w\}$ and define the relation R from A to B by

$$R = \{(1, y), (4, x), (4, z), (2, w), (2, y), (4, y)(1, x)\}$$

   (a) What is the domain of R?
   Solution:

   (b) What is the range of R?
   Solution:

   (c) Is it true that $4Rx$?
   Solution:

   (d) Is it true that $2Rx$?
   Solution:

   (e) List the elements in $\{n \in A \,\big|\, nRx\}$
   Solution:

   (f) List the elements in $\{\alpha \in B \,\big|\, 4R\alpha\}$
   Solution:

2. Define a relation R on $\mathbb{Z}$ by:

$$R = \{(x, y) \,\big|\, |x - y| \geq 1\}$$

   Prove that R is not transitive.
   Solution:

3. Define a relation R on $\mathbb{Z}$ by:

$$R = \{(x, y) \,\big|\, 4 \text{ divides } 3x - 7y\}$$

Prove that R is an equivalence relation.

Solution: