Name: _____ Quiz 16 MATH 300
October 29, 2024

1. Let $A = \{a, b, c, d\}$ and consider the following relation on A:
$R = \big\{(a, a), (a, c), (b, c), (b, b), (d, c), (a, b), (c, c), (d, b), (a, d)\big\}$.

   (a) Draw a diagram of this relation.

   (b) Is this relation reflexive?

   (c) Is this relation symmetric?

   (d) Is this relation transitive?

2. Consider the $\equiv \pmod 3$ relation on $\mathbb{Z}$. Prove that this relation is transitive.

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$R = \big\{(a, b), (b, a), (a, c), (c, a), (a, a), (b, b), (c, c), (d, d)\big\}$.

   (a) Draw a diagram of this relation.

   (b) Is this relation reflexive?

   (c) Is this relation symmetric?

   (d) Is this relation transitive?

2. Prove that the $|$ (divides) relation on $\mathbb{Z}$ is transitive.