

Homework 4

MATH 301

Due Wednesday, October 11, 2023

Instructions. Read the [Homework Guide](#) to make sure you understand how to successfully complete the assignment. All claims must be sufficiently justified.

****Note:** The due date is for the Wednesday after Exam 1. But, this content is fair game for Exam 1.

Exercise 1. Complete the following exercises from [Section 3.5](#) in the course textbook:

#35, 41, 45, *46, 47, *48

***Exercise 2.** Let H be a subgroup of a group G . Define the relation \sim on G by $a \sim b$ if $b^{-1}a \in H$. Prove that \sim is an equivalence relation on G .

****Exercise 3.** Suppose H is a nonempty finite subset of a group G and that H is closed under multiplication (that is, $ab \in H$ for all $a, b \in H$). Prove that H is a subgroup of G .