Math 500: Graduate Algebra. Instructor: Walton

Homework #2 on Subgroups and Quotient Groups

Due: Wednesday, September 11, 2019 at the beginning of class.

Include full statements of problems in your solution set. See syllabus for grading guide.

Let G denote a group.

(1) Dummit-Foote §2.2, #6, 10, 11

(2) Dummit-Foote §2.3, #8, 9

(3) Dummit-Foote §2.3, #12, 15, 23

(4) Dummit-Foote §2.4, #10, 11

(5) Dummit-Foote §2.4, #14(c,d), 15

(6) Dummit-Foote §2.5, #11

(7) Dummit-Foote §3.1, #24, 31

(8) Dummit-Foote §3.1, #32, 33, 34

(9) Take N a normal subgroup of G. Show that the quotient group G/N is abelian if and only if $xyx^{-1}y^{-1} \in N$ for all $x, y \in G$.

(10) Verify that if the quotient group $G/Z(G)$ is cyclic, then G is abelian.