Homework 11

Math 653, Fall 2019

This homework is due on Thursday, November 7.

1. Read Hungerford, Section 2.8

   (a) Section 2.7 #18

   (b) Section 2.8 #3, 5, 10

   (c) *(This problem is not to be turned in.)* Prove or disprove: *A finite group is nilpotent if and only if every Sylow subgroup is normal.*

   (d) *(This problem is not to be turned in.)* Compute the ascending and descending central series of the quaternion group, Q_8.

   (e) *(These problems are not to be turned in.)* Section 2.7 #14, 15

   (f) *(These problems are not to be turned in.)* Section 2.8 #1, 2, 4, 7

2. Let p and q be distinct primes. Is every group of order pq solvable? Is every group of order p^2q solvable? Prove your answers.

3. Let $n = p_1 p_2 \ldots p_k$ be a factorization into (not necessarily distinct) primes. Find a composition series for the dihedral group D_{2n}. What are the factors?