

## MATH 380, PROBLEM SET 3

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### 1. PROBLEMS

- (1) Find the order of the automorphism group of the Petersen graph. (First, look up a picture of the Petersen graph!)
- (2) Classify all groups of order 12.
- (3) Let  $G$  be a finite group and assume that  $\text{Aut}(G)$  acts transitively away from the identity. Show that  $G \cong C_p \times C_p \times \dots \times C_p$ , where  $p$  is prime.
- (4) Show there is no simple group of order 84.
- (5) Show that not all groups can arise as  $\text{Aut}(G)$  for some group  $G$ .