Math 2326 - Introduction to Abstract Mathematics
Assignment 21 - Due Monday, March 10

Problem 73: Suppose that G is a group and $a, b \in G$ such that $bab^{-1} = a^2$ and $| b | = 2$. If $a \neq e$, find $| a |$.

Problem 74: Let G be a group and suppose $H = \{x \in G \mid x^2 = e\}$. Show that if G is not Abelian, then H is not necessarily a subgroup of G.

Problem 75: Suppose that G is as group and let $H, K < G$. Prove or disprove the following statements.

a. $H \cap K < G$.

b. $H \cup K < G$.

Problem 76: In class we defined a finite cyclic group G to be one in which some element in G has the same order as G itself. Show that $U(10)$ is cyclic but $U(8)$ is not.