

Abstract Algebra 1
Quiz 8

Name: _____

You have 10 minutes to complete this quiz. If you have a question raise your hand and remain seated. In order to receive full credit your answer must be **complete**, **legible** and **correct**. Show your work, and give adequate explanations.

1. Let G be a group and let K and H be subgroups of G . Define the property: “ K normalizes N ”.

“ K normalizes N ” means that “ $(\forall k \in K)(kNk^{-1} = N)$ ”.

2. State the Second Isomorphism Theorem.

If G is a group, $K, N \leq G$ are subgroups, and K normalizes N , then

$$KN/N \cong K/(K \cap N).$$

Some people might include additional conclusions in this theorem, such as

- $K \vee N = KN$
- $N \triangleleft KN$
- $K \wedge N = K \cap N$
- $(K \cap N) \triangleleft K$

These additional conclusions “set up the diamond” with perspective normalizing quotients. But the “main conclusion” of the theorem is the blue part above.