Quiz 6
You must give complete, mathematically correct proofs to receive full credit!!

Problem 1. (5 points) Let G be a nonabelian group of order p^3 for some prime p, and suppose that $\mathbf{Z}(G)$ is nontrivial. Prove that $|\mathbf{Z}(G)| = p$.

Problem 2. (5 points) Let $\phi : G \to H$ be a group homomorphism and let $N \trianglelefteq H$. Prove that $\phi^{-1}(N) \trianglelefteq G$.