Due Thursday, March 8 at the beginning of class.
No late homework will be accepted.

Name:

This homework is worth 30 points. For credit, show all your work in a clear and organized manner. No credit will be given for inconclusive proofs.

1. (4 points) Let $G$ be a group and let $a \in G$. Let $m$ be a positive integer. Show that $a^m = e$ if and only if the order of $a$ divides $m$.

2. (4 points) Σ28 Section 10.

3. (3 points) Σ29 Section 10.

4. (3 points) Σ34 Section 10.

5. (2 points) Σ16 Section 11.

6. (3 points) Σ39 Section 11.

7. (4 points) Let $\phi : S_3 \rightarrow S_3$ be the map defined by $\phi(x) = x^2$. Is $\phi$ a group homomorphism? If your answer is “yes”, prove it, if your answer is “no” provide a specific counterexample.

8. (3 points) Σ49 Section 13.

9. (4 points) Σ50 Section 13.