63. Let $G$ be an abelian group of order $g$, and let $\hat{G}$ be the set of irreducible characters of $G$.
(a) Show that $\hat{G}$ is an abelian group which is (non-canonically) isomorphism to $G$.
(b) For $x \in G$ the mapping $\chi \mapsto \chi(x)$ is an irreducible character of $\hat{G}$ and so an element of $\hat{G}$. Show that the resulting map $G \to \hat{G}$ is injective, hence a (canonical) isomorphism.

64. Dummit-Foote, 19.1, #3.


PRACTICE (do not hand in): Write out the character tables for $D_8$ and $Q_8$ (this is done in the book – give the details); Dummit-Foote, 19.1, #1, 2, 8, 10.