Due 4/25 (Wednesday):
All (turn in): Chapter 10, page 206, 14-18, 20, 24

Chapter 10

Exercise 14

Explain why the correspondence x $\longrightarrow$ 3x from Z_{12} to Z_{10} is not a homomorphism.

Exercise 15

Suppose that ϕ is a homomorphism from Z_{30} to Z_{30} and Ker $\phi = \{0, 10, 20\}$. If $\phi(23) = 9$, determine all elements that map to 9.

Exercise 16

Prove that there is no homomorphism from $Z_8 \bigoplus Z_2$ onto $Z_4 \bigoplus Z_4$.

Exercise 17

Prove that there is no homomorphism from $Z_{16} \bigoplus Z_2$ onto $Z_4 \bigoplus Z_4$.

Exercise 18

Can there be a homomorphism from $Z_4 \bigoplus Z_4$ onto Z_8? Can there be a homomorphism from Z_{16} onto Z_2 $\bigoplus Z_2$? Explain your answers.

Exercise 20

How many homomorphisms are there from Z_{20} onto Z_8? How many are there to Z_8?

Exercise 24

Suppose that ϕ: Z_{50} $\longrightarrow Z_{15}$ is a group homomorphism with $\phi(7) = 6$.

    a. Determine ϕ(x).

    b. Determine the image of ϕ.

    c. Determine the kernel of ϕ.

    d. Determine $\phi^{-1}(3)$. That is, determine the set of all elements that map to 3.