Math 220 – Homework 10

Due Tuesday 11/22 at the beginning of class

PART A

Problems from the textbook:

Section 3.1 # 3(a,b), 8(b), 10(b), 15(b) (hint: see problem 17 from section 3.2), 17, 20, 21(b)(hint: see problem 21 from section 3.2), 22(b) (hint: see problem 22 from section 3.2)

Section 3.2 # 17, 21, 22

PART B

1. Let $f : \mathbf{R} \to \mathbf{R}$ be defined by $f(x) = 2016 - 4x$. Compute $f([-4, 1])$.*(Give a formal proof.)*
2. Let $f \in F(\mathbf{R})$ be defined by $f(x) = 9 - 7x$ and $W = [-5, 2]$. Compute $f^{-1}(W)$. *(Give a formal proof.)*
3. For each of the following functions write out $f(X)$ and $f^{-1}(W)$ for the given sets X and W, where $f : \mathbb{Z} \to \mathbb{Z}$.**(No proofs are necessary.)**

   (a)
   $$f(n) = \begin{cases} n+1 & \text{if} \quad n \in \mathbb{E} \\ n & \text{if} \quad n \in \mathbb{O} \end{cases}, \quad X = \{0, 1, 5, 9\}, \quad W = \mathbb{O}.$$

   (b) $f(n) = n^2$, $X = \{-2, -1, 0, 1, 2\}$, $W = \{2, 7, 11\}$