Math 220 – Homework 11

Due Thursday 11/29 at the beginning of class

Total points: 134

PART A

Problems from the textbook:

- Section 5.5

problem	1	2	4*	5(b)	6(a)*	6(b)	10*
points	24	16	10	10	10	10	10

PART B

1. Let $f : \mathbb{R} \to \mathbb{R}$ be defined by $f(x) = 3x - 2019$.

   (a) * [10 points] Compute $f([-3, 3])$. *(Give a formal proof.)*

   (b) * [10 points] Compute $f^{-1}([-3, 3])$. *(Give a formal proof.)*

2. Let $f : \mathbb{R} \to \mathbb{R}$ be defined by $f(x) = x^4$.

   (a) * [10 points] Compute $f([-2, 2])$. *(Give a formal proof.)*

   (b) * [8 points] Compute $f([-2, 0])$. *(Give a formal proof.)*

3. [16 points] For each of the following functions write out $f(A)$ and $f^{-1}(B)$ for the given sets A and B, where $f : \mathbb{Z} \to \mathbb{Z}$. **(No proofs are necessary.)**

   (a)
   $$f(n) = \begin{cases} 1 - n & \text{if} \quad n \in \mathbb{E} \\ 2 - n & \text{if} \quad n \in \mathbb{O} \end{cases}, \quad A = \{0, 1, 7, 11\}, \quad B = \mathbb{O}.$$

   (b) $f(n) = n^4$, $A = \{-2, -1, 0, 1, 2\}$, $B = \{2, 7, 11\}$