Math 300 – Homework 9

Due Thursday 11/14 at the beginning of class

Total points: 85 (Writing portion: 65 pts (all the problems marked by $*$).)

PART A

Problems from the textbook:

- Section 5.4* # 1(b,c, d).[45 points]

PART B

1. [10 points] The functions $f, g : \mathbb{R} \to \mathbb{R}$ defined by $f(x) = 2x + 1$ and $g(x) = 3x - 5$ are bijective. Determine the inverse function of $g \circ f$ and $g \circ f^{-1}$.

2. [10 points] Let $a, b \in \mathbb{R} - \{0\}$ and let functions $f, g : \mathbb{R} \to \mathbb{R}$ be defined by

$$f(x) = ax + b, \quad g(x) = x + \frac{b}{a}.$$

   Compute the *inverse* function of $g \circ f^{-1}$.

3. * [10 points] Let $f : \mathbb{R} \to \mathbb{R}$ be defined by $f(x) = 2019 - 3x$. Compute $f([-3, 3])$.(*Give a formal proof.*)

4. * [10 points] Let $f : \mathbb{R} \to \mathbb{R}$ be defined by $f(x) = x^6$. Compute $f([0, 2])$.(*Give a formal proof.*)