

**Math 220 – Homework 9**

Due Thursday 04/06 at the beginning of class

Total points=100

**PART A**

Problems from the textbook:

**Section 3.2** # 1(e); 5pts, 9 5pts; 10, 5pts 13(c,e) 10pts ; 14(a,e) 10pts ;**Section 3.3** # 1(b,c) 10pts; 2(b) 10pts, 11(a,b) 20pts**PART B**

1. Determine whether the following function is injection. Give a formal proof of your answer.

(a) 5pts  $f \in F(\mathbb{R})$  defined by  $f(x) = 16x^{16} - 14x^{14} - 2x^2 + 1$ (b) 10pts  $f \in F(\mathbb{Z})$  defined by  $f(n) = \begin{cases} n + 2018, & \text{if } n \in \mathbb{E} \\ -n + 2018, & \text{if } n \in \mathbb{O} \end{cases}$ 2. 10pts Determine whether the function  $f \in F(\mathbb{Z})$  defined by  $f(n) = \begin{cases} 2n, & \text{if } n \in \mathbb{E} \\ -n + 22, & \text{if } n \in \mathbb{O} \end{cases}$  is surjective.

Give a formal proof of your answer.