

Math4010 Problem Set 2

Due date: _____

Please attach the appropriate cover sheet to your assignment when you turn it in. Remember that it must be stapled and also that you cannot turn this in late! **To get full credit, you must have neat work, show all work, and circle or box all handwritten answers!!**

This assignment has two parts. Part A is a list of problems, which you need to write up individually. Part B is a group assignment. We will discuss this in class as well as choose groups. For Part B, please turn in your write-up with this assignment (answering questions 1 – 8).

Part A:

(1) From the book (10 pts each):

2.3 B #11, 20, 21

3.1 B #16, 23

3.2 B #5, 10, 22, 34

3.3 B #9, 19

Chapter 3 Test (pg 152-153) #2, 6, 8, 10

(2) Discussion of Zero. (Must be typed and in your own words!) (20 pts) Zero is quite a special number with some unique qualities, so we need to give it some attention. Please answer these questions with complete sentences.

- (a) What is zero?
- (b) Why do we need zero?
- (c) Discuss how zero behaves
 - (i) With addition.
 - (ii) With subtraction.
 - (iii) With multiplication.
 - (iv) With division.
 - (v) As an exponent.

Be sure to illustrate with examples and explain clearly what problems are associated with zero.

(3) Reflection Question: (Must be Typed) (10 pts) How can studying other number systems help us better understand our own number system? How will it help you teach children?

Part B: (80 pts)

Your group will create a new number system using only these four symbols:

Δ • O
 \square

Develop a system that lets you represent any amount.

In your group, discuss different alternatives and come up with one you all agree on. Answer these questions when deciding on the best system.

- Does this system make sense?
- How can you explain it to others?
- How is it better than other alternatives?
- What characteristics would provide for simplicity, yet make your system powerful enough to do computations needed by your group?

On a separate sheet of paper, write a description of your system and answer the following questions using your new number system.

- 1 The name of your new system (feel free to be creative here).
- 2 A table showing your symbols for the numbers, along with some explanation necessary to understand your system.
- 3 Which properties or characteristics does this new system have (e.g. additive, multiplicative, place holders, place value, zero, subtractive, etc.)?
- 4 What are the advantages and disadvantages to your system?
- 5 Express the numbers 2761 and 305 in your number system.
- 6 Count to 20 with your number system.
- 7 Add $217 + 358$ using your number system (and show your work).
- 8 Subtract $541 - 106$ using your number system (and show your work).