MATH 2001
INTRODUCTION TO SETS

(1) Consider the following five items:

I) $\varnothing$ II) $\mathbb{Q}$ III) $\{\varnothing\}$ IV) π V) $\{\{1\}\}$

Give a brief explanation as to why each item is or is not a set.

(2) Consider the following sets:

I. $\varnothing$ II. $\{\{\}\}$ III. $\{\varnothing, \{\}\}$

How would you read each of these items out loud (write out what you would say)? Which of these is/are equal to $\{\varnothing\}$?

(3) True or false? Explain.

$$\{\{c, a\}, b, \{a\}\} = \{\{a, c\}, \{b\}\}$$

(4) Consider the following set:

$$A = \{\{\{x\}, d\}, \{d, x\}, \{x\}, \{d, \{x\}\}, \{\varnothing, x\}\}.$$

(a) Which of the following statements are true?

(i) $x \in A$

(ii) $d \notin A$

(iii) $\{x, d\} \in A$

(iv) $\varnothing \in A$

(b) What is the cardinality of this set?