

First Writing Assignment, Math220

General Instructions:

- Write your name on the top of the first page.
- The solutions to the problems have to be typed (using for example Scientific Notebook, MS Word, Latex, Tex) in correct English.
- The style should follow the usual style of text books. Each assignment should start on a new page.
- Typical format of a definition:

Definition. Let A and B be sets. The *union of A and B* is defined to be the set

$$A \cup B := \{x | x \in A \vee x \in B\}$$

- Typical format of a Theorem, Proposition, etc:
Theorem 1. If n and m are two even integers then nm is divisible by 4.
- Enumerate theorems, propositions.
- Start a proof by

Proof. and end it by

□

or by

qed

or any other sign at the right end of the last line.

- Look up definitions, or results you are using in other math text books, or, for example Wikipedia. Reference all texts at the end of your paper.

Example. Write at the end of you paper (list all material alphabetically):

REFERENCES

[BK] R. J. Bond and W. J. Keane, *An introduction to abstract mathematics*, Brooks/Cole Publishing Company (1999).

Then, if you use, say Theorem 3.1.4 on page 87. you write: The Intermediate Value Theorem (cf. [BK, Theorem 3.1.4]) implies that.....

- Once you are done with the first assignment turn it in for suggestions. All assignments are due on **April 29**.

Problems

- (1) For integers a and b , define what it means to say that a divides b . We will write $a|b$ if a divides b
- (2) For integers a , b and n , define what it means to say that a and b are congruent modulo n . We will write in this case $a \equiv b \pmod{n}$
- (3) Prove: For integers a , b and c . If $a|b$ and $a|c$, then $a|(b + c)$.
- (4) Prove: For integers a , b and c . If $a|b$ and $a|c$ then $a|bc$.
- (5) State an improvement of the previous problem and prove it.