Math 112 homework #5. Due 10/31

He who can properly define and divide is to be considered a god.

- Plato[1]

(1) Read Section 3.1 and 3.2 thoroughly. Make sure you understand *everything*. Begin to read 3.3.

(2) Do the following exercises from pages 111-113 of the course notes:

- 3.2
- 3.7 – all of the parts!!
- 3.8
- 3.9
- 3.10
- 3.12   Hint: suppose d is a common divisor of n and $n+1$. Use a corollary from the beginning of Wednesday's class.
- 3.16   Hint: The structure of this argument is similar to the proof we did at the end of Wednesday's class. Show that the greatest common divisor of a, b and c is also a divisor of (a, b) and of (a, c). Then show that any common divisor of (a, b) and (a, c) is also a divisor of a and of b and c.

(3) (Bonus question)

So what is a greatest common divisor, *really*? Why is this a useful notion?

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[1]I admit this quotation is out of context. "Define and divide" does not really refer to *divisors of integers* here. But Plato does think highly of division! vis: "Arithmetic has a very great and elevating effect, compelling the soul to reason about abstract number... You know how steadily the masters of the art repel and ridicule any one who attempts to divide absolute unity when he is calculating, and if you divide, they multiply, taking care that one shall continue and not become lost in fractions" [from the *Republic*]. Please do not become lost in fractions while you do your homework.