UPDATED GENERAL INFORMATION — JANUARY 13, 2014

Modifications to `math145Anotes04.pdf`

The file in the course directory has been modified, with a couple of minor corrections and details of some points mentioned in the lectures but not in the previous version of the notes. Here are the changes:

On page 4.6 there is a reference to a new page 4.13 for a variation on Sutherland, Proposition 4.7; the variant form implies that between two real numbers one can always find a number with is a nonnegative integer plus a finite decimal fraction. This fact was mentioned in the lectures.

There is a new page 4.6A which explains in detail how the validity of Sutherland, Proposition 4.7, for the case $0 < a < b$ implies its validity for all a, b such that $a < b$. This was also discussed in the lectures, and the new page includes some details that may not have been evident in the lectures.

On page 4.7 there is a minor correction; an inequality

$$ 0 \ < \ \frac{c-1}{d} \quad \text{is corrected to} \quad 0 \ \leq \ \frac{c-1}{d} \ . $$

The old page 4.8A is now 4.8B, and there is a new page 4.8A, which proves that the usual infinite decimal expansions actually define real numbers (using the Comparison Test for series with nonnegative terms, a standard tool from first year calculus). The question of whether such expansions always define real numbers was raised in the lectures and answered verbally.

On page 4.12 there is a minor correction to the remark in the margin: The maximum and minimum values of a function are unequal *provided the function is not constant.*

As noted above, there is a new page 4.13, whose contents are described in the discussion for page 6. Working the exercises listed below is **strongly recommended.**

Definitions of fundamental concepts from Chapter 4

It is important to be so familiar with a few definitions and axioms that there is no need to search for them when the concepts appear. Otherwise the chances of getting lost as the course progresses are very high. Therefore the following definitions and axioms should be memorized:

> The definition of a least upper bound.
> The completeness property (axiom) for the real number system.
> The definition of a limit for a sequence.
> The definition of a continuous function for a real valued function of one variable.

It is very likely that the first quiz will involve stating several of these definitions or axioms in a satisfactory manner.