Math 330 Section 3 Homework 14

Due date: Friday, November 6, 2015 *Running total:* 45 *points*
Last submission Friday, November 20, 2015

Special note - What's on exam 2:
a. *MF write-up ch.4: will have a simple proof on the exam.*
b. *MF write-up ch.5: no proofs, but defs and true/false questions*
c. *MF write-up ch.7 until before ch.7.1.2:* ***Disproportionately high importance:***
c1. *def. metric space*
c2. *examples of distance functions, incl.* $d(f,g) := \|f-g\|_\infty = \sup\{|f(x)-g(x)| : x \in \textit{domain}(f)\}$
c3. *Thm 7.1: norms define metrics*
c4. *Prop 7.1:* $\|f\|_\infty$ *defines a norm (hence a metric by thm.7.1)*
d. *B/G ch.8-11 with focus on ch.9.1, ch.10, ch.11.*

Status - Reading Assignments:

Here is the status of the reading assignments you were asked to complete by this date.

Textbook:
all of ch.1 - 11 (ch.7.2 was optional),

Other course material (course materials page):
"Logic part 1", "Sets part 1", "Sets part 2", "Functions part 1", "Functions part 2"

"Lecture Notes: Math 330 - Additional Material":
All of ch.3 (understand the material)
all of ch.4 (understand the proofs!)
all of ch.5 (learn all definitions and the two theorems at the end, skip the proofs
All of ch.6 (understand the material) EXCEPT ch. 6.2.2 on normed vector spaces
Chapter 7 until end of subchapter 7.1.1: "Measuring the distance of real functions"

New reading assignment - Due Fri, Nov.6:

B/G ch.12

Assignment 1:

Prove B/G Prop.11.6, p.108: Let $m,n,s,t \in \mathbb{Z}$. Let $n,t \neq 0$. Then $\dfrac{m}{n} + \dfrac{s}{t} = \dfrac{mt+ns}{nt}$.

Assignment 2:

Prove B/G Thm.11.12, p.110: If $r \in \mathbb{N}$ is not a perfect square, then $\sqrt{r}$ is irrational.
Hint: Study the proof of prop.11.10 carefully and you'll see that you can use it with small alterations.

Assignment 3:

Use everything up-to and including prop.11.10 PLUS all of prop.11.20 and prop.11.21 to prove the following:

Let $m,n \in \mathbb{Z} \setminus \{0\}$. Then $(m/n)\sqrt{2}$ is irrational.