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9. Complete the following assignment prior to Meeting #6:

A. Study our notes from Meeting #5 ; comprehend Jim's sample responses to the Quiz #5 prompts that are posted on *Canvas*.

B*. Examine each of the following propositions, determine whether or not it is true, display your choice by circling either "T" or "F," and prove that your choice is correct (Please post the resulting PDF file using the indicated Assignment link on Canvas):

i. $(f \subseteq \{\,^{-}1, 0, 1\,\} \times \{\,^{-}1, 0, 1\,\} \ni f(x) = x^2) \rightarrow$
$f : \{\,^{-}1, 0, 1\,\} \xrightarrow[onto]{1:1} \{\,^{-}1, 0, 1\,\}$

T **F**

$\{-1, 0, 1\}$ The mapping is not 1:1.
$f(x)$
$\{-1, 0, 1\}$

ii. $\{\, n^2 : n \in \mathbf{N} \,\} \sim \mathbf{N}$

T F

$|\mathbb{N}| = |\{n^2 : n \in \mathbb{N}\}|$ and there is a one to one mapping: $f(x) = \{(1,1), (2,4), (3,9), \ldots\}$

iii. $\mathbf{Z} \sim \mathbf{N}$

T F

In class, we used the following to prove $\mathbb{Z} \sim \mathbb{N}$.

$$f : \mathbb{Z} \rightarrow \mathbb{N} \ni (f(x) = -2x \;\forall x < 0 \wedge f(x) = 2x+1 \;\forall x \geq 0)$$

iv. $[\,0, 1\,] \sim [\,2, 3\,]$

T F

$|[0,1]| = |[2,3]|$ and there exist a one to one mapping.

$f(x) = x+2 = \{(0,2), (2,3), \ldots\}$

v. $[\,^{-}1, 0\,] \sim [\,0, 0.25\,]$

T F

Same as previous, Cardinalities are the same, and you can find a 1 to 1 mapping.

vi. $V = \mathbf{Z} - \{\,^{-}n : n \in \omega\,\}^c = \mathbf{N}$

$\omega = \{0, 1, 2, \ldots\}$

T F

$\{-n : n \in \omega\} = \{0, -1, -2, -3, \ldots\}$

$\{-n : n \in \omega\}^c = \{1, 2, 3, \ldots\}$

$\{1, 2, 3, \ldots\} = \mathbb{N}$ ✓

C*. The following proposition is, of course, true:

$\mathbf{Z} \sim \mathbf{R} \veebar \mathbf{Z} \nsim \mathbf{R}$

Which one of the following propositions do you think is true? Circle either "$\mathbf{Z} \sim \mathbf{R}$" or "$\mathbf{Z} \nsim \mathbf{R}$" to indicate your choice: $\mathbf{Z} \sim \mathbf{R}$ $\mathbf{Z} \nsim \mathbf{R}$

Write a paragraph that explain the rationale for your choice.

I may be wrong, but even though they are both infinate sets, R is bigger than Z. For example, between 1 and 2 inclusive, in Z there are 2 elements. But, in R, There exist an infinate number of elements.

D. Compare your responses to the homework prompts to those Jim posted in *Canvas* on the usual page.

E. Comprehend the entries from Lines #018–020 from our *Glossary* document.