Homework 03, Morally Due 12:30PM, Tue Feb 17, 2026

1. (0 points) What is your name?

2. (20 points)

   (a) (0 points)

   Look at the slide packet *Infinite Ramsey Thm For Graphs.*

   Look at Slides 102-119.

   Slide 102 is titled *Formal Construction.*

   Slide 119 is titled *Some Color Appears Infinitely Often.*

   READ and UNDERSTAND the construction and how it captures the intuitive construction I presented in that slide packet.

   (b) (20 points)

   Look at the slide packet *Infinite Ram on Z*

   Look at Slides 70-100.

   Slide 70 is titled $c \leq 2$

   Slide 100 is titled *We Are Done*

   Write up the construction formally, similar to what you read and understood in Part 1 of this question.

GO TO NEXT PAGE

3. (20 point) Look at the slide packet *Inf Can Ram*
   Look at Slide 90 titled *Step 3 and Beyond*

   (a) (10 points) Describe how to process x_3.
   (b) (10 points) Describe how to process x_n.

4. (20 point) Look at the slide packet *Inf Can Ram*.
   Look at Slide 143 titled *Is H_1 Max-Homog?*
   Prove that H_1 is Max-Homog.

5. (20 points) Look at the slide packet *Inf Can Ram.*
   Look at Slide 143 titled *Need to do More To Get Rainbow Set*
   Prove that, for all c, for all $x \in H_1$, $\deg_c(x) \leq 2$.

6. (20 points) Look at the slide packet *Inf Can Ram*
   Look at Slide 194 titled *Proof of Theoerm*
   Do the Complete Construction.

GO TO NEXT PAGE

7. (0 points but you must do it)

   (a) Listen to as much of *The Bolzano Weierstrass Rap* as you can stand. Here it is:
   `https://www.youtube.com/watch?v=eM3S74kchoM&list=FLllaX0oj-4_KcE1C4JF72gw`

   (b) I feel a moral obligation to present you with math songs that are better than the BW Rap (hmmm, that would be all math songs).

   Here is a link to my collection of math songs:

   `https://www.cs.umd.edu/~gasarch/FUN/mathsongs.html`

   Pick 5 using any criteria you like (e.g., You are a Swiftie so you want to listen to the linear algebra song *u belongs to V*), listen to them, and give me your opinion of some of them as you see fit.