1 Page 1

1. This is mostly for the sake of my curiosity, not for proofreading purposes: could you elaborate on what "The following is folklore" means before Theorem 1.4? My impression is that calling a mathematical result "folklore" means that the result is widely accepted to be true, but it either isn't proven or the "proofs" existing aren't up to par. But that definition doesn't seem to fit this situation, since you give a proof right below.

2. Assume that every color appears in the image While this is technically correct I think $> \alpha n$ *times* would make it more clear that we're no longer requiring the color classes to be the same cardinality and just setting a minimum.

2 Page 2

No corrections!

3 Page 3

1. In the 3rd bullet point of

   Color of $z_k + r - y_1$,

   I don't see how the inequality follows since we don't have any information about what $z_{k'+1}$ is. I think the proof that $z_k - y_1$ is G given in the paper is necessary in order to derive a contradiction. Also, in that case the contradiction is that the index k is not minimal, not that the distance r is not minimal.

2. In the recap, it should be just (r, y_1), not (r_1, y_1). This also applies to page 4.

4 Page 4

1. Since the arguments for "Color of $z_t - 2$" are identical to the arguments for "Color of $z_t - 1$", I think it'd be best to only run through the

argument for one of them and say the argument for the second one is similar.

2. I also think the phrasing you used on page 5

   If $z_k + 1 \in G$ *then* $z_k + 1$ *and* z_k *are adjacent elements of* G *with difference 1*

   is cleaner than the phrasing you used to show $z_t - 1$ cannot be in G

   If $z_t - 1 \in G$ *then* $z_t - 1 = z_t - 1$ *and* $z_t - z_{t-1} = 1$

   I'd suggest adapting the phrasing from page 5 to this case as well.

3. Actually I think in all cases where the page 5 phrasing is used (including page 6), it might be clearer to replace

   adjacent elements of G

   with

   successive elements of G;

   I can see *adjacent elements of* G potentially trying to describe

   $\{(z_k, z_{k+1}) \in G \times G : z_k + 1 = z_{k+1}\}$

   rather than

   $\{(z_k, z_{k+1}) \in G \times G : 1 \leq k \leq |G| - 1\}$

   like we want. Clarifying that *adjacent elements* refers to pairs in the second set would also work.

5 Page 6

In the 2nd bullet point of "Color of $z_k + 1$", that should be "$z_k + 1$" instead of "$z_k - 1$"

6 Page 7

It should be *We can assume* $3 \in R$

7 Page 8–9

1. Typo edit: We prove try to prove that every odd number $\leq n$ is in R.

2. I think the inductive hypothesis should be

   ≥ 1 and $2i - 1 \in R$,

   and we try to prove $2i+1 \in R$ given that. With the current hypothesis, the inductive step would involve proving that two different values are in R. However, we only proved that one value $(2i + 3)$ is in R.

3. We're still inside of Case 5 in the original case breakdown, so instead of writing "Case 1" and "Case 2" in the inductive proof, "Case 5.1" and "Case 5.2" would probably be clearer.

4. The 2nd bullet of *Color of* $z_k - (2i + 1)$ isn't a rainbow solution, the correct rainbow solution is $(z_k 0 - (2i + 1)) + (2i - 1) = z_k - 2$ (G, R, B).

5. All cases of "2k" should be "2i"

6. On page 9 you're using A, B, C in some places, which should be mapped to R, G, B respectively.

7. In "Color of $2i + 3$" on page 9, $2k - 1 - z_k$ should be $2i + 1 - z_k$. The labels beneath the terms in the equation should also be (G, R, B) from left to right.