CMSC 752 Homework 12
Morally Due Tue April 29, 2025
Dead Cat May 1

1. (50 points) Let $k \in \mathsf{N}$. Show the following

   $\forall c\ \exists W = W(c)$ *such that,* $\forall$ COL: $[W] \to [c]$ $\exists a, d$ *such that*

   $$a, a + d^2 + d, a + d^2 + 2d, \ldots, a + d^2 + kd$$

   are all the same color.

   You may assume VDW's theorem, which the cool kids call, PVDW(ω).

2. (50 points) Show the following

   $\forall c\ \exists W = W(c)$ *such that,* $\forall$ COL: $[W] \to [c]$ $\exists a, d$ *such that*

   $$a, a + d^3$$

   are all the same color.

   You may assume PVDW(ω, ω).