Some Quiz Answers and HW05 Some Solutions

William Gasarch-U of MD

Quiz Real vs Fake

1. Eugene Wigner. REAL
2. Herbert Scarf. REAL
3. Samuel Harrington. REAL
4. Dorwin Cartrwright. REAL
5. Frank Harary. REAL
6. Charles Percy Snow. REAL
7. Jacob Fox. REAL
8. Sandor Szalai. REAL
9. Paul Erdos. REAL
10. Paul Turan. REAL
11. Vera Sos. REAL

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12. Sir Woodson Kneading. FAKE. Anagram of Doris Kearns Goodwin, Historian.
13. H.K. Donnut. FAKE. Anagram of Don Knuth, Founder of Algorithmic Analysis.
14. Moss Chill Beaches. FAKE. Anagram of Michael Beschloss, Historian.
15. Tim Andrer Grant. FAKE. Anagram of Martin Gardner, Recreational Math Columnist.
16. Alma Rho Grand. FAKE. Anagram of Ronald Graham, Combinatorist.
17. D.H.J. Polymath. FAKE. Used for anon authors of Density Hales Jewitt Thm.
18. Ana Writset. FAKE. Anagram of Ian Stewart, Recreational Math Columnist.
19. Tee A. Cornet. FAKE. Anagram of Terrence Tao, Mathematician.

20,21,22 Andy Parrish, Stephen Fenner, Clyde Kruskal. REAL.

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You can fool some of the people all of the time, and all of the people some of the time, but you can't fool all of the people all of the time.

Problem 2

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For all k, c *there exists* n *such that for all* $\mathrm{COL}\colon \binom{[n]}{3} \rightarrow [c]$ *there exists a homog set of size* k*.*

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Use COL_1, COL_2, ..., to get $\binom{\mathsf{N}}{3} \rightarrow [c]$:
$e_1, e_2, \ldots$ are list of all edges (3-sets).
Color e_1 the way e_1 is colored for inf many COL_i. KILL.

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$H = \{h_1 < h_2 < \cdots < h_k\}$ is homog set for ∞ many of the COL_i.

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FCR (Finite Can Ramsey)
For all k, c *there exists* n *such that for all* $\mathrm{COL}\colon \binom{[n]}{2} \to \omega$ *either there is a homog set of size* k *OR a min-homog set of size* k *OR a max-homog set of size* k *OR a rainb set of size* k*.*

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OH- there might not be such a color since could have $\mathrm{COL}_i(e_1)$.

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ONE Let n be such that for all for all $\mathrm{COL}\colon \binom{[n]}{4} \to [16]$ there is a homog set of size k. The first proof I gave of infinite Can Ramsey, using 4-hypergraphs, works here.

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2) You get a maximal set of size $\sim k^3$ where every points has color-degree ≤ 1. A maximal rainb set of this set is of size $\sim (k^3)^{1/3} = k$.

Problem 4

Points in the plane- goto other slide packet.