Lec 10/15

Monday, October 15, 2018 14:49

Open Problem: Let $E \subset \mathbb{N}$ be syndetic. is E GP-rich?

Not known: $x, xq, xq^2 \in E$!!!

even $x, xq^2 \in E$ not known.

$\Downarrow$

E/E contains a square

#3: $\mathbb{N} = \bigcup_{i=1}^{r} (S - t_i) \Rightarrow S - t_i$ is AP-rich $\Rightarrow S$ is AP-rich

so by finitistic vdW, $S \cap T$ is AP-rich.

Ex: does vdW follows from the fact that any syndetic set is AP-rich

Call a set $A \subset \mathbb{N}$ piecewise syndetic if it contains $S \cap T$ where T is thick & S is syndetic.

Ex: Show if $\mathbb{N} = \bigcup_{i=1}^{r} C_i$ then one of C_i is PWS.

Ex: If E is PWS & $E = \bigcup_{i=1}^{r} C_i$ then one C_i is PWS.

Is it true that $\bar{d}(A) > 0 \Rightarrow A \supset$ a shift of an IP set?

#6: $d(A \cap (A-n_1)) = \frac{1}{4}$ (in particular, $A \cap A-n_1 \neq \emptyset$).

$$d(\underbrace{(A \cap (A-n_1)) \cap ((A \cap (A-n_1))-n_2)}_{A \cap A-n_1 \cap A-n_2 \cap A-n_2-n_1}) = \frac{1}{16}$$

Reading: Thru Ch 11 by friday

Ex: does $P-1$ contain an IP set?