

We discussed the following two propositions in class, I waved my hands convincingly, no one objected, we moved on. Write proofs for the propositions.

Proposition 1: If $U \subset M$ is open dense, then U^c is closed nowhere dense in M .

Proposition 2: Let $G_n \subset M$ be open dense. Then

$$\bigcap_{n=1}^{\infty} G_n = M \setminus \bigcup_{n=1}^{\infty} G_n^c$$

where the complement of each G_n is closed nowhere dense.

Problem (This is instead of problem 20, page 201, but could be used to answer it in a slightly roundabout fashion.) Prove that \mathbb{Q} is a thin set, the union of a countable collection of closed, nowhere dense sets. (Pugh defines 'nowhere dense' on page 107, should you care.)

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Do also:

pg. 263: 42