# Lec 11/15

Wednesday, November 15, 2017 14:19

Google: Hasse-Minkowski Principle Amy Noether

LeVeque (fundamentals) for proof of Dirichlet Thm.

Weierstrass Theorem Proof.

For Friday: finish Ch 3, read sums of four squares packet

$x$ normal $\Rightarrow$ $\mathbb{N}x$ normal.

true even w/ $\mathbb{Q}$.

Think about $x^2 + 2y^2 + 4z^2 - 6xyz = 1$

Suggestion: show $\overline{\frac{P}{P}} = [0, \infty)$ (exercise)

Math Sci Net (Mendes-Frantz solution)

Liouville numbers:

Uncountable

Dense

0 measure

topologically large

Def: $S \subset \mathbb{R}$ is dense $G_\delta$ if, besides being dense, it contains (sometimes equals) $\bigcap_{i=1}^{\infty} G_n$ where $G_n$ are dense & open in $\mathbb{R}$.

exercise: verify Liouville #s are dense $G_\delta$

$i=1$

exercise: verify Liouville #s are dense $G_\delta$

Find out: Roth Theorem on approximation of algebraic #s.

exercise: Champernowne's # is transcendental but not Liouville

$$(n+1)^2 + n^2 = c^2$$

$$2n^2 + 2n + 1 = c^2$$

$$4n^2 + 4n + 1 - 2c^2 = -1$$

$$(2n+1)^2 - 2c^2 = -1$$

$n = x^2 + 3y^2$ . Do mod 3

$n = 3k$
$3k+1$
$3k+2$

exercise: finish this line of reasoning