Cat & Lauren — 2.0

Fatima & Eleonor — 1.5

Corina & Robert — 1.0

Ronaldo & Claudia — 1.5

George & Angel — 1.0

x^2+1, 2

$3x^4-x+1$, 4

$\mathbb{Z}[x] = \bigcup_{d \in \mathbb{N}\cup\{0\}} X_d$

$X_d = \{p \in \mathbb{Z}[x];$ degree of $p(x)$ is "d"$\}$

$X_d \to \mathbb{Z}^{d+1}$

$a_d x^d + a_{d-1}x^{d-1} + \dots + a_0 \mapsto (a_d, a_{d-1}, \dots, a_0)$

$\overline{\mathbb{Q}} = \bigcup_{d \in \mathbb{N}\cup\{0\}} X_d$

$X_d = \{x;$ x is an algraic number, which is a root of a polynomial of degree "d".$\}$

$\frac{p}{q}$ $\quad px - q = 0 \iff x = \frac{p}{q}$

$\mathbb{Q} \subseteq \overline{\mathbb{Q}} \subseteq \mathbb{R}$

$a \in \overline{\mathbb{Q}}$

$a \in (c,d)$

$\mathbb{Q}$ is dense

$r \in (a,b)$

1 2 3 4

21. $A = \{x_1, x_2, x_3, \dots\}$

$X - \emptyset = X$

$X - \{1\}$ = uncountable

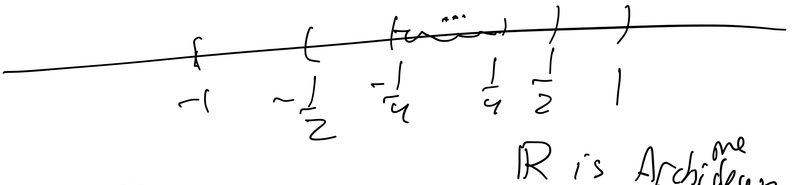
$\vdots$

$X - \{2, 2, \dots, n\}$ = uncountable $\Rightarrow$ $X - \{1, \dots, n, n+1\}$ uncountable

24. Fix $n \in \mathbb{N}$, $X_i = (-\frac{1}{i}, \frac{1}{i})$

$r \in \mathbb{R}$

$\forall i \quad -\frac{1}{i} < r < \frac{1}{i}$



$\bigcap_{n=1}^{\infty} (-\frac{1}{n}, \frac{1}{n}) = \emptyset$

$\mathbb{R}$ is Archimedean

$c > 0$

$0 < \frac{1}{n} < c$

$r < \frac{1}{n}$ $\forall n$

$n < \frac{1}{r}$

$\Rightarrow$ there is no $r \in -\frac{1}{n} < r < \frac{1}{n}$ $\forall n \in \mathbb{N}$

$[a_i, b_i]$

$\bigcap [\sup a_i, \inf b_i] \neq \emptyset$