$$H \xrightarrow[\text{isoton}]{F} \mathbb{R} \Longrightarrow \begin{cases} \underline{F} \text{ exists ae} \\ H \xrightarrow[\text{meas}]{\underline{F}} \bar{\mathbb{R}}_+ \\ \int^{a|x} \underline{F} \leqslant {}^{x}F - {}^{a}F \end{cases}$$

$$E_{u:v} = \frac{x \in H}{\partial_x F > v > u > \partial_x F}: \quad s = \lambda_{E_{u:v}} < \infty \Longrightarrow \bigwedge_{\varepsilon > 0} \bigvee_{H \supset V \supset E_{u:v}} \lambda_V \leqslant s + \varepsilon$$

$$\bigwedge_{x \in E_{u:v}} \underline{\lim} \frac{{}^{x}F - {}^{x-h}F}{h} < u \Longrightarrow \mathcal{K} = \frac{K = -|x \subset V}{x \in E_{u:v}: \quad V_K(F) < u|K|} \text{ Vitali-cover of } E_{u:v}$$

$$\Longrightarrow \bigvee_{\text{disj } K_n \in \mathcal{K}}^{n \in N \text{ finit}} \lambda_{E_{u:v} \llcorner \bigcup_n^N K_n} \leqslant \varepsilon: \quad U = \bigcup_n^N \overset{-1}{K}_n$$

$$\bigwedge_y^{E_{u:v} \cap U} \overline{\lim} \frac{{}^{y+h}F - {}^{y}F}{h} > u \Longrightarrow \mathcal{H} = \frac{H = y|- \subset U}{y \in E_{u:v} \cap U: \quad V_H(F) > u|H|} \text{ Vitali-cover of } E_{u:v} \cap U$$

$$\Longrightarrow \bigvee_{\text{disj } H_m \in \mathcal{H}}^{m \in M \text{ finit}} \lambda_{E_{u:v} \cap U \llcorner \bigcup_m^M H_m} \leqslant \varepsilon$$

$$\lambda_{E_{u:v} \cap U} = \lambda_{E_{u:v} \cap \bigcup_n^N K_n} \geqslant s - \varepsilon \Longrightarrow \lambda_{E_{u:v} \cap \bigcup_m^M H_m} \geqslant s - 2\varepsilon$$

$$v(s - 2\varepsilon) \leqslant v \lambda_{E_{u:v} \cap \bigcup_m^M H_m} \leqslant v \sum_m^M |H_m| < \sum_m^M V_{H_m}(F) = \sum_n^N \sum_{H_m \subset K_n} V_{H_m}(F)$$

$$\leqslant \sum_n^N V_{K_n}(F) < u \sum_n^N |K_n| = u \lambda_U \leqslant u \lambda_V \leqslant u(s + \varepsilon)$$

$$\varepsilon \rightsquigarrow 0 \Longrightarrow vs \leqslant \text{ʅ} \Longrightarrow s = 0 \Longrightarrow \lambda_{E_{u:v}} = 0$$

$$\frac{x \in H}{\partial_x F > \partial_x F} = \bigcup_{\mathbb{Q} \ni u < v \in \mathbb{Q}} E_{u:v} \Longrightarrow \lambda_{\frac{x \in H}{\partial_x F > \partial_x F}} = 0$$

$$\partial F \underset{\text{ae}}{=} \partial F \Longrightarrow \bigwedge_x {}^{x}\underline{F} = \lim \frac{{}^{x+h}F - {}^{x}F}{h} \in \bar{\mathbb{R}}_+$$

$$f_n(x) = {}^{x+1/n}F - {}^{x}F \geqslant 0 \Longrightarrow \text{ meas } n f_n \rightsquigarrow \underline{F} \text{ ae}$$

$$\int^{a|b} f_n = \int^{b|b+1/n} F - \int^{a|a+1/n} F = \frac{{}^bF}{n} - \int^{a|a+1/n} F \leqslant \frac{{}^bF - {}^aF}{n} \Leftarrow \frac{{}^aF}{n} \leqslant \int^{a|a+1/n} F$$

$$\Rightarrow \int^{a|b} \underline{F} \leqslant \underline{\lim} \int^{a|b} n f_n \leqslant {}^bF - {}^aF \Rightarrow \underline{F} \text{ int } \Rightarrow \underline{F} < \infty \text{ ae } \Rightarrow F \text{ diff ae}$$

$$H \xrightarrow[\alpha \text{ stet}]{F} \mathbb{R} \Rightarrow \int_{dt}^{a|x} {}^t\underline{F} = {}^xF - {}^aF$$

$$H \xrightarrow[\beta \text{ var}]{F} \mathbb{R} \Rightarrow {}^t\underline{F} \text{ exists ae } \wedge \underline{F} \text{ int}$$

$$\text{spez}: \quad \underline{F} \underset{\text{ae}}{=} 0$$

$$\bigwedge_{\varepsilon > 0} \bigvee_{\delta > 0} \bigwedge_{\mathcal{A} \text{ a-disj}} |V|_{\mathcal{A}}(1) \leqslant \delta \Rightarrow |V|_{\mathcal{A}}(F) \leqslant \varepsilon$$

$$\Rightarrow E = \frac{x \in a|y}{{}^x\underline{F} = 0} \text{ Vitali-cover } \mathcal{K} = \frac{K = x|- \subset a|y}{{}^x\underline{F} = 0: \quad |V|_K(F) \leqslant \varepsilon|K|} \Rightarrow \bigvee_{\text{disj } K_n \in \mathcal{K}}^{n \in N \text{ finit}} \lambda_{E \llcorner \bigcup_n^N K_n} \leqslant \delta$$

$$a|y = \bigcup_n^N K_n \cup \bigcup_m^M U_m \text{ compl open int}$$

$$\sum_m^M |U_m| = \lambda_{a|y \llcorner \bigcup_n^N K_n} = \lambda_{E \llcorner \bigcup_n^N K_n} \leqslant \delta$$

$$\Rightarrow \sum_m^M |V|_{\bar{U}_m}(F) \leqslant \varepsilon$$

$$\sum_n^N |V|_{K_n}(F) \leqslant \varepsilon \sum_n^N |K_n| \leqslant \varepsilon(y - a)$$

$$\Rightarrow |{}^yF - {}^aF| \leqslant \sum_n^N |V|_{K_n}(F) + \sum_m^M |V|_{\bar{U}_m}(F) \leqslant \varepsilon(1 + y - a)$$

$$\varepsilon \rightsquigarrow 0 \Rightarrow {}^yF = {}^aF \Rightarrow F = \text{ const}$$

$$\text{allg}: \quad {}^xG = \int^{a|x} \underline{F}\, \alpha \text{ stet } \Rightarrow F - G \alpha \text{ stet}$$

$$\underline{F-G} = \underset{-}{F} - \underset{-}{G} \underset{\text{ae}}{=} 0$$

$$\Rightarrow F - G = \text{ const } = {}^{a}F - {}^{a}G = {}^{a}F \Rightarrow {}^{x}F = {}^{a}F + {}^{x}G = {}^{a}F + \int^{a|x} \underset{-}{F}$$