

$$P \xrightarrow[\text{ramified covering}]{\pi} \mathbb{P}$$

$$P \overset{\Delta}{\sim} q \xleftarrow[\text{ext}]{\hat{\pi}^*} \mathbb{P} \overset{\Delta}{\sim} q$$

$$\log^{P:q} \zeta_s = \sum_{n \geq 1} \frac{q^n \triangleleft P}{nq^{ns}}$$