$$C \xrightarrow[\text{onj}]{\pi} \mathbb{P}$$

$$^C k \xleftarrow[\text{inj}]{\pi k} {}^\mathbb{P} k = k|z \text{ rat}$$

$$\sqrt{z} = \frac{z{:}w \in \mathbb{C}^2}{w^2 = z} \xrightarrow[\text{onj}]{\pi} \mathbb{P} \ni z$$

$$k|w = {}^C k \xleftarrow[\text{inj}]{\pi k} {}^\mathbb{P} k = k|z \text{ rat}$$

$$k|w = \underbrace{k|w^2} \times w \underbrace{k|w^2} = \underbrace{k|z} \times w \underbrace{k|z} = \widehat{k|z}^{\,1:w}$$