

$$\begin{array}{ccc}
 R & \xrightarrow{\phi} & K \\
 & \searrow \iota & \uparrow \exists! \Phi \\
 & & Q(R)
 \end{array}$$

$$\begin{array}{ccc}
 a & \xrightarrow{\phi} & \phi(a) \\
 & \searrow \iota & \uparrow \Phi \\
 & & \frac{a}{1}
 \end{array}$$