

$$\begin{array}{ccccc}
 A & \xlongequal{\quad} & A & \longrightarrow & 0 \\
 \downarrow & & \downarrow f & & \downarrow \\
 \operatorname{im}(f) & \longrightarrow & B & \twoheadrightarrow & \operatorname{cok}(f)
 \end{array}$$