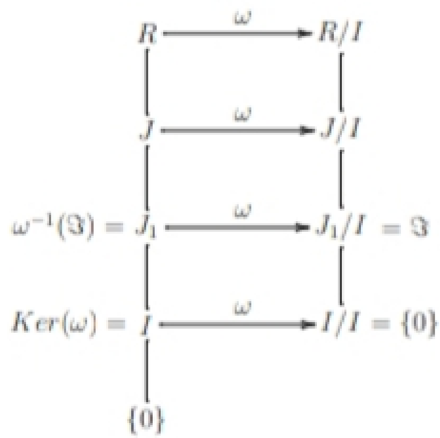
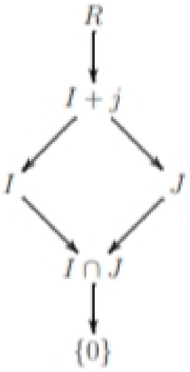


Note that a ring homomorphism preserves subsets and ideal.

Theorem 1.51 (2^{nd} *Isomorphism Theorem*)



$$\frac{I+J}{I} \cong \frac{J}{I \cap J} \quad also \quad \frac{I+J}{J} \cong \frac{I}{I \cap J}$$