



$\tilde{\varphi}$ Grp-Iso

$$\gamma \in \ker \varphi \quad \delta \in H \Rightarrow \varphi(\gamma) = 0 \Rightarrow \varphi(\gamma\delta) = \underbrace{\varphi(\gamma)}\varphi(\delta) = 0\varphi(\delta) = 0 \Rightarrow \gamma\delta \in \ker \varphi$$

$$\varphi(\delta\gamma) = \underbrace{\varphi(\delta)}\varphi(\gamma) = \varphi(\delta)0 = 0 \Rightarrow \delta\gamma \in \ker \varphi$$

$$\alpha \in \varphi(H) \Rightarrow \exists \gamma \in H \quad \alpha = \varphi(\gamma) \Rightarrow \varphi(\alpha) = \underbrace{\varphi(\varphi(\gamma))} = \varphi(\varphi(\gamma)) \in \varphi(H)$$

$$\varphi(\overline{\gamma + \ker \varphi} \circ \overline{\delta + \ker \varphi}) = \varphi(\overline{\gamma\delta + \ker \varphi}) = \varphi(\overline{\gamma\delta}) = \underbrace{\varphi(\gamma)}\varphi(\delta) = \overline{\varphi(\gamma) + \ker \varphi} \overline{\varphi(\delta) + \ker \varphi}$$