[redacted] $G = \langle x \rangle$ & G is abelian.

~~Let $x, y \in G$.~~

$\exists\, \phi_{: G \to H} \mid \phi(xy) = \phi(x)\phi(y) \quad \forall x, y \in G$.

G is cyclic $\Longrightarrow$ G is abelian.

Let $n, m \in H$.

Good!

Prove that $nm = mn$.

Let ϕ be the isomorphic map $G \to H$. ϕ is onto, by def. of isomorphism.

$\exists x \in G \mid \phi(x) = n$ since ϕ is onto.

$\exists y \in G \mid \phi(y) = m$ " ______ ".

So, $nm = \phi(x)\phi(y)$

$= \phi(xy)$ ✓ b/c ϕ is a homomorphism

$= \phi(yx)$ b/c G is ~~cyclic &~~ abelian.

$= \phi(y)\phi(x)$ b/c ϕ is a homomorphism.

$= mn$ ✓