The Fundamental Homomorphism Theorem

Recall the fundamental homomorphism theorem that says that if $\varphi : \mathcal{G} \to \mathcal{H}$ is a homomorphism between groups $\mathcal{G}$ and $\mathcal{H}$ then $G/\mathrm{Ker}(\varphi) \cong \varphi(\mathcal{G})$. Keep this in mind as you do the following:

1. Consider the group 3229. Find a normal subgroup of order 4 and call it $\mathcal{H}$.
2. What group in the library is the factor group $3229/\mathcal{H}$ isomorphic to?
3. Construct a homomorphism φ from 3229 **onto** some group of order 8.[1]
4. Use the subgroup tab on 3229 to form and export the factor group of 3229 modulo the kernel of φ.
5. Construct an isomorphism from this exported factor group to the group of order 8 you used in 3. (Explain how this isomorphism is defined canonically.)
6. Find a homomorphism from 3229 onto 0805 or else show that no such function exists.

[1]Notice how the homomorphism screen depicts the table of the image group - with repetitions. The homomorphism tool is great for illustrating results like the fact that all image values occur with equal frequency and the order of the image divides the order of the domain, etc.