

# Cosets

Consider the group  $3202$ . Find a normal subgroup of order 4 and a nonnormal subgroup of order 4. Make sure you notice how the coloring of the coset table depicts these differences. What are the isomorphism types for the factor groups of order 8 in this group?<sup>1</sup>

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<sup>1</sup>When you find such factor groups, export them for further analysis. Some very useful ideas here (which you may or may not want to develop with your class ahead of time) are as follows: (i) When a subgroup  $\mathcal{H}$  is not normal, then the same is true of every conjugate of this subgroup. (ii) All subgroups of the center are always normal.