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Reading Assignment 5
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For activities 20.7 and 20.8 we looked at the smallest subgroup of a group containing an element in the group. For activity 20.7 we looked at the smallest subgroup of the group $(\mathbb{Z}, +)$ containing 5. This subgroup must contain the identity element zero, the inverse of 5, and any element that can be obtained using addition of these three elements (closure property of a group). We proved that the set $\{5m|m \in \mathbb{Z}\}$ is a subset of this smallest subgroup and went on to prove that the smallest subgroup of $(\mathbb{Z}, +)$ is a subset of $\{5m|m \in \mathbb{Z}\}$ and is therefore equal to $\{5m|m \in \mathbb{Z}\}$.

In activity 20.8 we generalized what we had done in 20.7 and showed that the smallest subgroup of G containing a, denoted $\langle a \rangle$, is the set $\{a^n|n \in \mathbb{Z}\}$. In this case, a^0 is the identity element in G and a^{-n}, where $n \in \mathbb{N}$, is the inverse of a^n.