

Answer on Question #58978 – Math – Abstract Algebra

Question

Find index of subgroup generated by 3 in Z_{12} .

Solution

$H = \langle 3 \rangle$ and $G = Z_{12}$. Note that $H = \langle 3 \rangle = \{0, 3, 6, 9\}$, therefore, $|H| = 4$. Since $|G| = |Z_{12}| = 12$, by Lagrange's Theorem, the index of subgroup generated by 3 in Z_{12} is $[G : H] = |G|/|H| = 12/4 = 3$.

Answer: 3.