Practice quiz

Mark the squares that are followed by correct statements. All representations are considered over complex numbers.

 \Box Any representation of the group S_5 is completely reducible.

 \Box – Any representation of the group $\mathbb Z$ is completely reducible.

□ There exists a representation V of S_6 with $\chi_V(1) = 5$ and $\chi_V((12)) = -7$.

 $\Box \quad \text{The group } S_{10} \text{ has three isomorphism classes of one-dimensional representations.}$

 $\hfill\square$ Any one-dimensional representation of a group is completely reducible.

 $\Box \quad \text{There exists a representation of } S_2 \text{ with } \chi_V(1) = 8$ and $\chi_V((12)) = 0.$

 $\Box \quad \text{There exists a representation of } S_3 \text{ with } \chi_V(1) = 8$ and $\chi_V((23)) = 0.$

 \Box The sign representation appears with multiplicity 1 in the regular representation of S_4 .

 \Box The fundamental 3-dimensional representation appears with multiplicity 2 in the regular representation of S_4 .

 \Box The regular representation of a finite group G contains the trivial representation of G.

 $\Box \quad \text{The group } \mathbb{Z}/2 \times \mathbb{Z}/3 \text{ has six isomorphism classes of irreducible representations.}$

 $\Box \quad \text{The group } \mathbb{Z}/2 \times \mathbb{Z}/3 \text{ has six isomorphism classes of one-dimensional representations.}$