Assignment 1

Due on 2020-09-20, 23:59 IST.

Week 9
1. The set $S = \{0, 1, 2, 3\}$ is a group under addition. Which of the following statements about $S$ is true? 

   a) $S$ is a group under multiplication.
   b) $S$ is a field under addition.
   c) $S$ is a ring under addition.
   d) $S$ is a group under subtraction.

   [True/False]

Week 10
1. Let $G$ be a group and $H$ be a subgroup of $G$. Let $a, b \in G$. Then which of the following statements is true?

   a) $aH = bH$ if and only if $a^{-1}b \in H$.
   b) $aH = bH$ if and only if $ab^{-1} \in H$.
   c) $aH \subseteq bH$ if and only if $a^{-1}b \in H$.
   d) $aH \subseteq bH$ if and only if $ab^{-1} \in H$.

   [True/False]

Week 11
1. Let $G$ be a group and $H$ be a subgroup of $G$. Let $a, b \in G$. Then which of the following statements is true?

   a) $aH = bH$ if and only if $a^{-1}b \in H$.
   b) $aH = bH$ if and only if $ab^{-1} \in H$.
   c) $aH \subseteq bH$ if and only if $a^{-1}b \in H$.
   d) $aH \subseteq bH$ if and only if $ab^{-1} \in H$.

   [True/False]

Week 12
1. Let $G$ be a group and $H$ be a subgroup of $G$. Let $a, b \in G$. Then which of the following statements is true?

   a) $aH = bH$ if and only if $a^{-1}b \in H$.
   b) $aH = bH$ if and only if $ab^{-1} \in H$.
   c) $aH \subseteq bH$ if and only if $a^{-1}b \in H$.
   d) $aH \subseteq bH$ if and only if $ab^{-1} \in H$.

   [True/False]