

Question: 0

Let $G = A_4$ and suppose that G acts on itself by conjugation; that is, $(g, h) \mapsto ghg^{-1}$.

- Determine the conjugacy classes (orbits) of each element of G .
- Determine all of the isotropy subgroups for each element of G .

Solution:

Question: 6

Find the conjugacy classes and the class equation for each of the following groups.

- S_4
- D_4
- \mathbb{Z}_9
- Q_8

Solution:

Question: 10

Find the number of ways a six-sided die can be constructed if each side is marked differently with $1, \dots, 6$ dots.

Solution:

Question: 12

Consider 12 straight wires of equal lengths with their ends soldered together to form the edges of a cube. Either silver or copper wire can be used for each edge. How many different ways can the cube be constructed?

Solution:

Question: 13

Suppose that we color each of the eight corners of a cube. Using three different colors, how many ways can the corners be colored up to a rotation of the cube?

Solution: