Assignment 4

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

Due on 2018-09-26, 23:59 IST.

1) Let \( i, j, k \) denote elements in Hamilton’s quaternions with properties \( i^2 = -1, j^2 = -1, ij = -ji = k \). Then the group generated by \( i \) has order:

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Numeric) 4

2) Let \( i, j, k \) denote elements in Hamilton’s quaternions with properties \( i^2 = -1, j^2 = -1, ij = -ji = k \). Then the group generated by \( i, j, k \) has order:

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Numeric) 8

3) A non-identity diagonal matrix \( M \) represents a rotation in three dimensions. Then which of the following is/are correct about \( M \)?

- No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Numeric) 2 points

- trace of \( M \) is negative.
- determinant of \( M \) is negative.
- \( M^2 \) is identity matrix.
trace of $M$ is negative.
$M^2$ is identity matrix.
determinant of $M$ is positive.

4) What is/are the correct statement(s) about SO(3)?

☐ It has finitely many finite subgroups.
☐ It has infinitely many finite subgroups.
☐ It has finitely many infinite subgroups.
☐ It has infinitely many infinite subgroups.

No, the answer is incorrect.
Score: 0
Accepted Answers:
It has infinitely many finite subgroups.
It has infinitely many infinite subgroups.

5) The group SO(2) of rotations in two dimensions is:

☐ Abelian
☐ Non-abelian
☐ Finite
☐ Infinite

No, the answer is incorrect.
Score: 0
Accepted Answers:
Abelian
Infinite

6) Number of elements of order 2 in the group of rotational symmetries of a regular tetrahedron is:

☐ 3
☐ 4
☐ 6
☐ 8

No, the answer is incorrect.
Score: 0
Accepted Answers:
3

7) How many elements are there in the group of rotational symmetries of an icosahedron?

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) 60

8) Which of the following is/are false about the finite cyclic group of order $m$?
It is a subgroup of SO(3).
Its order is equal to the number of its conjugacy classes.
Its order is a prime number.
It is a subgroup of $S_n$, the symmetric group on $n$ symbols, for a suitable $n < m$.
It is a subgroup of SO(2).

No, the answer is incorrect.
Score: 0

Accepted Answers:
Its order is a prime number.
It is a subgroup of $S_n$, the symmetric group on $n$ symbols, for a suitable $n < m$. 