Unit 4 - Week 2 - Structure of groups
Assignment 2

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment. Due on 2018-09-12, 23:59 IST.

1) How many edges are there in the Cayley graph of $D_4$, the group of symmetries of a square? Here we are considering the Cayley graph with respect to two generators (flipping about x-axis and rotation by 90 degrees)?

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) 12

2) Pick all groups which are abelian (that is, every pair $a$, $b$ of elements satisfies $ab = ba$).

- Klein 4-group.
- Group of symmetries of a pentagon.
- Invertible matrices over real numbers, under multiplication of matrices.
- Cyclic group with 6 elements.
- Group of non-zero rational numbers, under multiplication.

No, the answer is incorrect.
Score: 0
Accepted Answers:
Klein 4-group.
Cyclic group with 6 elements.
Group of non-zero rational numbers, under multiplication.

3) Which of the following is/are true about free group on one letter.

- It is infinite.
- It is the group of symmetries of a circle.
- All elements $a$ and $b$ of it satisfy $ab = ba$.

No, the answer is incorrect.
Score: 0
Accepted Answers:
It is infinite.
All elements $a$ and $b$ of it satisfy $ab = ba$.

4) In the groups $D_4$ of symmetries of a square, how many elements $g$ satisfy $gf = fg$, where $f$ denotes the flipping about x-axis?

No, the answer is incorrect.
Score: 0
Accepted Answers:
5) True or false: In the game of standard peg solitaire, if there are only two marbles which are left in the end, then their positions could be as follows:

No, the answer is incorrect.
Score: 0
Accepted Answers: False
The solved position of a 15-puzzle is as follows.

1 2 3
4 5 6 7
8 9 10 11
12 13 14 15

Consider two plausible configurations

I.
8 6 14 7
13 2 3 10
9 11 15
1 5 4 12

II.
8 3 14
2 6 4 7
13 1 11 10
5 9 12 15

Now, pick the correct option.

- Both I and II can be unscrambled to the original puzzle.
- Only I can be unscrambled to the original puzzle.
- Only II can be unscrambled to the original puzzle.
- Neither I, nor II can be unscrambled to the original puzzle.

No, the answer is incorrect.
Score: 0
Accepted Answers:
Both I and II can be unscrambled to the original puzzle.