

MAT 150C, Spring 2021  
Homework 3

**Due before 12:10 on Monday, April 19**

*Please write the homework solutions in connected sentences and explain your work. Mark the answers to each question. Scan or take pictures of your homework and upload it to Gradescope before due time.*

1. Compute the character of the 4-dimensional permutation representation of  $S_4$ .
2. The group  $D_4$  acts on the set of vertices of a square. Compute the character of the corresponding representation.
3. The group  $D_6$  acts on the set of diagonals in a hexagon. Compute the character of the corresponding representation.
4. A representation of  $S_3$  has the following character:

|    |       |       |       |         |         |
|----|-------|-------|-------|---------|---------|
| 1  | (1 2) | (1 3) | (2 3) | (1 2 3) | (1 3 2) |
| 17 | -1    | -1    | -1    | 2       | 2       |

Decompose it into a direct sum of irreducible representations.