MAT 150A, Fall 2021
Homework 6
Due before 12:10 on Wednesday, November 10

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. Let A and B be the reflections in two lines with angle $\frac{\pi}{n}$ between them.

(a) Prove that $A^2 = B^2 = (AB)^n = I$.

(b) Prove that A and B generate the dihedral group D_n, that is, every element of D_n can be presented as a product of A and B in some order.

2. Consider the subgroup in S_4 generated by (2 4) and (1 2)(3 4). Prove that it contains 8 elements and is isomorphic to D_4.

3. Find a subgroup in D_6 isomorphic to D_3.

4. Describe all isometries of the infinite pattern: