Math 2326 - Introduction to Abstract Mathematics
Assignment 20 - Due Friday, March 7

Problem 71: Suppose that G is a group and that $x, y \in G$.

a. Suppose that $x^6 = e$ but $x^2 \neq e$, $x^4 \neq e$, and $x^5 \neq e$. With proof, find all of the possible values of the order of x.

b. If $y^{12} = e$, show that $|\ y| \neq 7$.

Problem 72: On the previous homework we showed that the elements of $\mathbb{Z}_{12}$ have the following orders:

element	order
0	1
1	12
2	6
3	4
4	3
5	12
6	2
7	12
8	3
9	4
10	6
11	12

a. Make a similar chart for $U(26)$, and compare the values of the orders to those in the above chart. What do you notice?

b. Make a similar chart for $\mathcal{D}_6$, and compare the values of the orders to those in the above chart. What do you notice? Are they the same?