Assignment 2 for Math 403 (due on Monday, January 28th)

FROM THE TEXT:

Section 3.4: Problems 46, 48, 53, Section 4.4: Problems 1b,c,d, 4a, 31.

ADDITIONAL PROBLEMS:

A: Consider the following elements in $U(\mathbb{C})$: i, $1+i$, $\frac{\sqrt{2}}{2}+\frac{\sqrt{2}}{2}i$, $\frac{1}{2}+\frac{\sqrt{3}}{2}i$. Determine the orders of those elements.

B: Find specific examples of noncyclic groups G of the following orders:

$$\big|G\big|=4, \quad \big|G\big|=6, \quad \big|G\big|=8, \quad \big|G\big|=12, \quad \big|G\big|=49, \quad \big|G\big|=64$$

C: Suppose that G is a group. Suppose that $a, b \in G$, that a has order 2, and that b has order 3. Assume also that $ab = ba$. Prove that ab has order 6.

D: Prove or disprove the following statement: *Suppose that G is a group, that $a, b \in G$, that a has order 2, and that b has order 3. Then ab has order 6.*