Day 20

Disjoint cycle form

Express the map $U(5) \to U(5)$ given by multiplying by 3 mod 5 in disjoint cycle form. Is this an even permutation or an odd permutation?

Lagrange's Theorem

1. What is 7^{121} mod 13?

(A) 1

(B) 3

(C) 7

(D) None of the above

2. How many subgroups does D_{13} have?

(A) 2

(B) 13

(C) 16

(D) None of the above

3. Let $\mathbf{R}^+$ be the set of positive reals and $\mathbf{R}^-$ the set of negative reals. Then...

(A) $\mathbf{R}^+$ and $\mathbf{R}^-$ are both subgroups of $\mathbf{R}^*$.

(B) $\mathbf{R}^+$ is a subgroup of $\mathbf{R}^*$ and $\mathbf{R}^-$ is a coset of $\mathbf{R}^+$.

(C) $\mathbf{R}^-$ is a subgroup of $\mathbf{R}^*$ and $\mathbf{R}^+$ is a coset of $\mathbf{R}^-$.

(D) None of the above.