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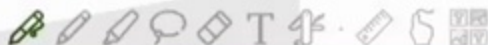
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GROUP THEORY
LECTURE -8
Tutor: Shruvi Priya

Let S_9 be the group of all permutations of the set $\{1, 2, 3, 4, 5, 6, 7, 8, 9\}$. Then the total number of elements of S_9 that commute with $\tau = (1\ 2\ 3)(4\ 5\ 6\ 7)$ in S_9 equals _____.



→ Cauchy's Lagrange's Theorem

2: Let $161 = p \cdot q$, where p and q are distinct primes. Then every proper subgroup of G is cyclic.



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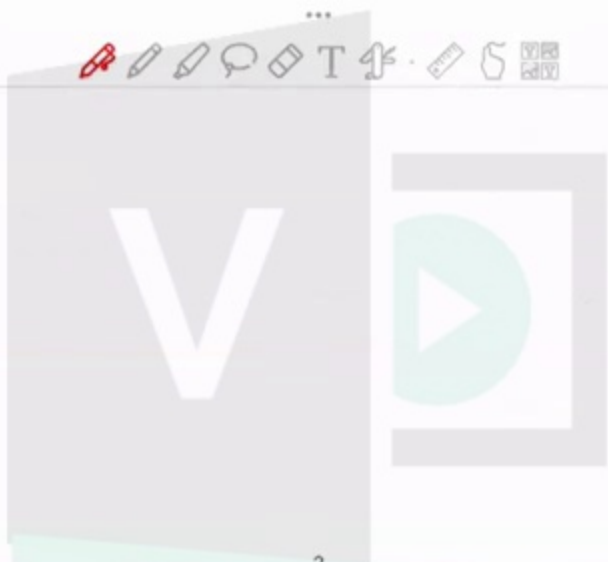
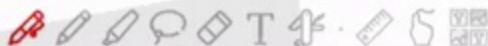
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→ Results on Lagrange's Theorem.

1. Let $|G| = pq$, where p and q are distinct primes. Then every proper subgroup of G is cyclic.

*2. $U(n)$, $n > 2$ is of even order.



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→ Results on Lagrange's Theorem.

1. Let $|G| = p \cdot q$, where p and q are distinct primes. Then every proper subgroup of G is cyclic.
- *2. $U(n)$, $n > 2$ is of even order.
3. If $|H| = m$, $|K| = n$, $\gcd(m, n) = 1$, where H and K are subgroups of G , then $H \cap K = \{e\}$.
- *4* Result on index of a subgroup: $(\mathbb{Q}, +)$ has no proper subgroup of finite index.

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