NOTATION AND TERMINOLOGY

\( \mathbb{Z} \) and \( \mathbb{Q} \) are, respectively, the ring of integers and the field of rational numbers.

Let \( n \) be a positive integer. \( \zeta_n \) denotes a primitive \( n \)-th root of unity. \( \mathbb{Z} \mod n \) is the multiplicative group of integers modulo \( n \).

Let \( z \in \mathbb{Z} \) and let \( p \) be a prime number. If \( p^m \) is the exact power of \( p \) dividing \( z \), then we call \( p^m \) the \( p \)-part of \( z \) and write \( p^m \| z \).

If \( A \) is a ring with \( 1 \), then \( M_n(A) \) is the ring of \( n \times n \) matrices with coefficients in \( A \). \( A^* \) is the group of invertible elements of \( A \).

All fields are assumed to be of characteristic 0. Let \( k \) be a field. We say that a field \( K \) is a cyclotomic extension of \( k \), only if there is a root of unity \( \zeta \) and an element \( \alpha \) of the cyclotomic field \( \mathbb{Q}(\zeta) \) such that \( K = k(\alpha) \).

\( G(K/k) \) is the Galois group of \( K \) over \( k \).

For \( \sigma \in G(K/k) \) and \( x \in K \), both \( \sigma(x) \) and \( x^\sigma \) denote the image of \( x \) by \( \sigma \).

\( N_{K/k} \) is the norm of \( K \) over \( k \).

The 2-cohomology group \( H^2(G(K/k), K^*) \) is, as usual, denoted by \( H^2(K/k) \).

Let \( K \) and \( k \) be cyclotomic extensions of \( \mathbb{Q} \) such that \( K \supseteq k \).

Let \( p \) be a rational prime and \( P \) (resp. \( p \)) a prime of \( K \).
(resp. $k$) lying above $p$. Then $K^p/k_p$ represents the isomorphy type of the completion of $K/k$ for $p|p$. We refer the ramification index (resp. the residue class degree) of $P$ from $k$ to $K$ as the ramification index (resp. the residue class degree) of $p$ in $K/k$. If $T$ (resp. $\phi$) is the inertia group (resp. a Frobenius automorphism) of $P$ with respect to the extension $K/k$, then we say that $T$ (resp. $\phi$) is the inertia group (resp. a Frobenius automorphism) of $p$ in $K/k$, etc.

Let $A$ and $B$ be central simple algebras. If $A$ is similar to $B$, we write $A \sim B$.

If $k$ is a finite extension of $Q_p$, the rational $p$-adic numbers, then $\text{inv}_k(A)$ is the (Hasse) invariant of $A$.

If $k$ is a finite extension of $Q$ and $p$ a prime of $k$, then $\text{inv}_p(A)$ is the invariant of $A$ at $p$.

All groups are assumed to be finite. Let $G$ be a group.

$|G|$ is the cardinality of $G$.

By an irreducible character $\chi$ of $G$, we mean an absolutely irreducible one.

$m_k(\chi)$ is the Schur index of $\chi$ over $k$.

$k(\chi)$ is a field obtained from $k$ by adjunction of all values $\chi(g)$, $g \in G$.

For $\sigma \in G(k(\chi)/k)$, $\chi^\sigma$ is the character of $G$ defined by $\chi^\sigma(g) = \sigma(\chi(g))$ for all $g \in G$.

If $\chi$ and $\psi$ are class functions on $G$, then $(\chi, \psi) = |G|^{-1} \sum_{g \in G} \chi(g) \cdot \psi(g^{-1})$. 
If $H$ is a subgroup of $G$, then $\chi|_H$ is the restriction of $\chi$ to $H$.

If $\theta$ is a class function on $H$, then $\theta^G$ is the class function on $G$ induced by $\theta$.

$\langle a, b, \cdots \rangle$ is the group generated by $a, b, \cdots$. 
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