– Notation Index –

Below is a list of symbols which will be used in the lecture, together with the corresponding english terminology. This list will be updated during the lecture with the new notation introduced.

General symbols

$\mathbb{C}$	field of complex numbers
$\mathbb{F}_q$	finite field with q elements
i	$\sqrt{-1}$ in $\mathbb{C}$
Id_M	identity map on the set M
$\mathrm{Im}(f)$	image of the map f
$\ker(\varphi)$	kernel of the morphism φ
$\mathbb{N}$	the natural numbers without 0
$\mathbb{N}_0$	the natural numbers with 0
$\mathbb{P}$	the prime numbers in $\mathbb{Z}$
$\mathbb{Q}$	field of rational numbers
$\mathbb{R}$	field of real numbers
$\mathbb{Z}$	ring of integer numbers
$\mathbb{Z}_{\geq a}, \mathbb{Z}_{>a}, \mathbb{Z}_{\leq a}, \mathbb{Z}_{<a}$	$\{m \in \mathbb{Z} \mid m \geq a$ (resp. $m > a, m \geq a, m < a)\}$
$\lvert X\rvert$	cardinality of the set X
δ_{ij}	Kronecker's delta
$\bigcup$	union
$\coprod$	disjoint union
$\bigcap$	intersection
$\sum$	summation symbol
$\prod, \times$	cartesian product
$\oplus$	direct sum
$\otimes$	tensor product
$\emptyset$	empty set
$\forall$	for all
$\exists$	there exists
$\cong$	isomorphism
$\overline{a}$	complex conjugate of $a \in \mathbb{C}$
$a \mid b$, $a \nmid b$	a divises b, a does not divise b
$f\lvert_S$	restriction of the map f to the subset S

Group theory

A_n	alternating group on n letters
C_m	cyclic group of order m in multiplicative notation
$C_G(x)$	centraliser of x in G
$C(G)$	set of conjugacy classes of G
D_{2n}	dihedral group of order $2n$
$\mathrm{Fix}_X(g)$	set of fixed points of g on X
G'	commutator subgroup of G
G/N	quotient group G modulo N
$\mathrm{GL}_n(K)$	general linear group over K
$H \leq G, H < G$	H is a subgroup of G, resp. a proper subgroup
$N \trianglelefteq G$	N is a normal subgroup G
$N_G(H)$	normaliser of H in G
$\mathrm{PGL}_n(K)$	projective linear group over K
Q_8	quaternion group of order 8

S_n	symmetric group on n letters
$\mathrm{SL}_n(K)$	special linear group over K
$\mathrm{Syl}_p(G)$	set of Sylow p-subgroups of the group G
$Z(G)$	centre of the group G
$\mathbb{Z}/m\mathbb{Z}$	cyclic group of order m in additive notation
$\lvert G\rvert$	order of the group G
$\lvert G : H\rvert$	index of H in G
$[x]$	conjugacy class of x
$[g, h]$	commutator of g and h
$\langle g\rangle$	cyclic group generated by g
$\langle g \mid g^m = 1\rangle$	cyclic group of order m generated by g

Rings and linear algebra

$R[X]$	ring of polynomials in an indeterminate X over the ring R
$R^\times$	group of units of the ring R
$\mathrm{char}(K)$	characteristic of the field K
$\det$	determinant of a matrix/linear transformation
$\dim_K$	K-dimension
$\mathrm{End}_K(V)$	endomorphism ring of the K-vector space V
$\mathrm{GL}(V)$	set of invertible linear transformations of the vector space V
$\langle x_1, \cdots, x_n\rangle_K$	K-linear span of the set $\{x_1, \cdots, x_n\}$
$M_{n\times m}(K)$	ring of $n \times m$-matrices with coefficients in K
$M_n(K)$	ring of $n \times n$-matrices with coefficients in K
$\overline{K}$	algebraic closure of the field K
Tr	trace of a matrix/linear transformation
$W \leq V$	W is a K-subspace of V
$\{e_1, \cdots, e_n\}$	standard basis of K^n
$(e_1, \cdots, e_n)$	standard ordered basis of K^n

Representations and characters

$C_1, \ldots, C_r$	the conjugacy classes of G
$\widehat{C_1}, \ldots, \widehat{C_r}$	the class sums of G
$\mathfrak{Cl}(G)$	$\mathbb{C}$-vector space of class functions on G
$\mathrm{Inf}_{G/N}^G$	inflation from G/N to G
$\mathrm{Irr}(G) = \{\chi_1, \ldots, \chi_r\}$	set of irreducible characters of G
$\ker(\chi)$	kernel of the characters of χ
K^G	space of K-valued functions of G
m_{jkl}	class multiplication constants of G
$Z(\chi)$	center of the character χ
$\rho \sim \rho'$	ρ is equivalent to ρ'
ρ_{reg}	the regular representation of G
ρ_V	representation associated to the G-vector space V
χ_{reg}	regular character of G
χ_V	character of the G-vector space V
$\omega_1, \ldots, \omega_r$	the central characters of G
$\langle -, -\rangle$	scalar product on $\mathfrak{Cl}(G)$
1_G	trivial character of G