

NOTATION INDEX

CONTENTS

- Abstract Groups
 - Group Invariants
 - Canonical Subgroups & Subsets
 - Special Groups
 - Commutator Notation
 - Group Constructions
 - Group Actions
- Calculus of Classes
 - Special Classes
 - Class Operators
- Rings & Fields
 - Subsets & Invariants
 - Special Rings & Fields
 - Ring Constructions
 - Fields
- Functors
- Skew Linear Groups
- Special Symbols

ABSTRACT GROUPS

GROUP INVARIANTS

Let G be a group.

- $h(G)$: the Hirsch number of the polycyclic-by-finite group G .
- $hah(G)$: see page 99.
- $hph(G)$: see page 99.
- $\text{rank}G$: the (Prüfer) rank of G , viz. the maximum of the minimum number of generators of the finitely generated subgroups of G .
- $\pi(G)$: the set of prime divisors of the orders of the elements of G of finite order.
- $|G|$: the order of G .

CANONICAL SUBGROUPS & SUBSETS

Let G be a group, α an ordinal number and i a positive integer.

- $G(\alpha)$: the α -th term of the derived series of G .
 $E(G)$: see page 71.
 $F(G)$: see page 71.
 $F^*(G)$: see page 71.
 $L(G)$: the set of left Engel elements of G (see page 116).
 $\bar{L}(G)$: the set of bounded left Engel elements of G (see page 116).
 $O_\pi(G)$: the unique maximal normal π -subgroup of G .
 $O_{\pi,\tau}(G) : O_{\pi,\tau}(G)/O_\pi(G) = O_\tau(G/O_\pi(G))$, where π and τ are sets of primes.
 $R(G)$: the set of right Engel elements of G (see page 116).
 $\bar{R}(G)$: the set of bounded right Engel elements of G (see page 116).
 $Z(G)$: the Zaleskiĭ subgroup of the soluble group G (see page 188).
 $\gamma^i(G)$: the i -th term of the lower central series of G .
 $\Delta(G)$: the FC-centre of G (see page 95).
 $\zeta_\alpha(G)$: the α -th term of the upper central series of G .
 $\zeta(G)$: the hypercentre of G , viz. $\bigcup_\alpha \zeta_\alpha(G)$.
 $\eta(G)$: the Hirsch-Plotkin radical of G .
 $\eta^{(\alpha)}(G)$: the α -th term of the upper locally nilpotent series of G (see page 99).
 $\eta_1(G)$: the Fitting subgroup of G .
 $\Lambda(G)$: see page 222.
 $\rho(G)$: see page 116.
 $\bar{\rho}(G)$: see page 116.
 $\sigma(G)$: the Gruenberg radical of G (see page 116).
 $\bar{\sigma}(G)$: the Baer radical of G (see page 116).

SPECIAL GROUPS

Let n be a positive integer.

- $\text{Alt}(n)$: the alternating group of degree n .
 C_n : the cyclic group of order n .
 C_∞ : the infinite cyclic group.
 $\text{GL}(n, q)$: the general linear group of degree n over the field $\text{GF}(q)$.

- $O(n, \mathbb{R})$: the n -dimensional real orthogonal group.
 Q_{2n} : the generalized quaternion group of order 2^n .
 $\text{Sym}(n)$: the symmetric group of degree n .
 $*X_n(q)$: a group of Lie type (see page 70).

COMMUTATOR NOTATION

Let x, y be elements of the group G .

- $[x, {}_1y] = [x, y] = x^{-1}y^{-1}xy$.
 $[x, {}_ny] = [[x, {}_{n-1}y], y]$ for $n \geq 2$.
 $S \in T, S \notin T$: see page 103.

GROUP CONSTRUCTIONS

Let $\{ G_i : i \in I \}$ be a family of groups.

- $G_1 \rtimes G_2$: the split extension of G_1 by G_2 , where G_2 acts on G_1 .
 $G_1 \wr G_2$: a wreath product of G_1 by G_2 , being the standard product unless a permutation representation is specified.
 $\prod G_i$: the cartesian product of the G_i .
 $\times G_i$: the direct product of the G_i .

GROUP ACTIONS

Let V be a set and G a group acting on V . Write v^g for the image of $v \in V$ under $g \in G$. Let X be a subset of V and let $v \in V$.

- $C_G(X) = \{ g \in G : x^g = x \text{ for all } x \in X \}$.
 $C_X(G) = \{ x \in X : x^g = x \text{ for all } g \in G \}$, the set of fixed points of X under G .
 $N_G(X) = \{ g \in G : X^g = X \}$.
 $v^G = \{ v^g : g \in G \}$.
 $\Delta_X(G) = \{ x \in X : x^G \text{ is finite} \}$.

Assume further that V is actually a G -module.

- $[V, {}_1G] = [V, G] = \langle v - v^g : \text{all } v \in V, \text{all } g \in G \rangle$.

$$[V_n G] = [[V_{n-1} G], G] \quad \text{for } n \geq 2.$$

CALCULUS OF CLASSES

SPECIAL CLASSES

- \underline{A} : the class of abelian groups.
 \underline{E}_p : the class of p -groups of finite exponent.
 \underline{F} : the class of finite groups.
 \underline{F}_p : the class of finite p -groups.
 \underline{G} : the class of finitely generated groups.
 \underline{G}_1 : the class of cyclic groups.
 \underline{I} : the class of locally indicable groups (see page 35).
 \underline{N} : the class of nilpotent groups.
 \underline{N}_1 : the class of groups all of whose subgroups are subnormal.
 \underline{O} : see page 26.
 \underline{O}_F : see page 162.
 \underline{O}_1 : see page 34.
 \underline{O}_2 : see page 37.
 \underline{P} : the class of polycyclic groups.
 \underline{S} : the class of soluble groups.
 $\underline{\bar{S}}$: see page 82.
 \underline{S}_g : see page 82.
 \underline{U} : see page 18.
 \underline{X} : see page 147.
 \underline{X}_F : see page 220.
 \underline{Y}_F : see page 219.
 \underline{Z} : see page 46.
 \underline{Z}_F : see page 219.
 \underline{Z}_0 : see page 46.

CLASS OPERATORS

Let \underline{X} be a class of groups.

- D : the direct product operator.
 L : the local operator.

- L_1 : $G \in L_1\mathcal{X}$ if and only if every cyclic subgroup of G is contained in an \mathcal{X} -subgroup of G .
- P : the poly (or extension) operator.
- \acute{P} : $\acute{P}\mathcal{X}$ is the class of groups with an ascending series whose factors are \mathcal{X} -groups.
- \grave{P} : as in \acute{P} , with "descending" in place of "ascending".
- \acute{P}_n : as in \acute{P} , but where the series is normal.
- P_n : as in \acute{P} , but where the series is finite and normal.
- Q : the quotient (or homomorphic image) operator.
- R : the residual operator.
- R_0 : the finite-subcartesian product operator.
- S : the subgroup operator.
- S_f : the subgroup-of-finite-index operator.

Let A be a unary closure operator.

- \mathcal{X}^A : the largest A -closed subclass of \mathcal{X} .
- \mathcal{X}^{-A} : the largest A -closed class of groups disjoint from \mathcal{X} .
- $\langle A, B \rangle$: the closure operator generated by the operators A and B .

RINGS & FIELDS

Rings except nilrings have a multiplicative identity, which is preserved by homomorphisms.

SUBSETS & INVARIANTS

Let R be a ring, X a subset of R , and \mathfrak{a} an ideal of R .

- $C_R(\mathfrak{a})$: the set of elements of R that are regular modulo \mathfrak{a} (see page 125).
- $e(A)$: the exponent of the algebra A (see page 48).
- $J(R)$: the Jacobson radical of R .
- $k(R)$: the Krull dimension of R .
- $\mathfrak{l}_R(X)$: the left annihilator of X in R .
- $m(A)$: the Schur index of the algebra A (see page 48).
- $Q(R)$: the quotient ring of R , whenever it exists.
- $\text{rad}_R X$: see page 141.

- $\text{rg}(X)$: the smallest subring of R (with 1) containing X .
 R^* : the set of non-zero elements of R .
 R_R : R regarded as a right module over itself.
 $r_R(X)$: the right annihilator of X in R .
 s_n : the standard polynomial identity of degree n .
 $U(R)$: the group of units of R .

SPECIAL RINGS & FIELDS

- \mathbb{A} : the algebraic closure of the rationals.
 \mathbb{C} : the field of complex numbers.
 \mathbb{F}_p : the field of p elements (p a prime).
 $\text{GF}(q)$: the field of q elements (q a prime power).
 \mathbb{Q} : the field of rational numbers.
 \mathbb{Q}_p : the field of p -adic numbers.
 $\mathbb{Q}(\zeta_m)$: the m -th cyclotomic field over the rationals.
 \mathbb{Z} : the ring of rational integers.
 \mathbb{Z}_p : the ring of p -adic integers.

RING CONSTRUCTIONS

- A_p : see page 49.
 $A(L)$: the universal enveloping algebra of the Lie algebra L .
 (R, S, G, H) : the crossed product of S by H (see page 23).

Let S be a ring and G a group.

- SG : the group ring of G over S .
 S^*G : a skew group ring of G over S , some action of G on S being specified (see page 25).

If S is a subring of a ring R and G is a subgroup of $U(R)$ normalizing S , then

- $S[G]$: the subring of R generated by S and G .
 $S(G)$: the division subring of R generated by S and G in situations where R and S are division rings.

FIELDS

Let F be a field.

- $\mathbb{A}(F)$: the quaternion F -algebra (see page 49).
 $\det(x)$: the determinant of the matrix x .
 $\deg(f)$: the degree of the polynomial f .
 \tilde{F} : the perfect closure of F .
 $\text{Br}(F)$: the Brauer group of F .

Let F be a finite Galois extension of K .

- $N_{F/K}(x)$: the norm of the element $x \in F^*$.
 $N_{F/K}$: the subgroup of K^* of all $N_{F/K}(x)$ for $x \in F^*$.
 $\text{Gal}(F/K)$: the Galois group of F over K .

Assume further that K is an algebraic number field and that \mathfrak{P} is a non-trivial prime ideal of the ring of algebraic integers of K .

- $e(\mathfrak{P}, F/K)$: the ramification index of \mathfrak{P} in F/K (see page 49).
 $f(\mathfrak{P}, F/K)$: the residue degree of \mathfrak{P} in F/K (see page 49).
 O_K : the ring of algebraic integers of K .
 $K_{\mathfrak{P}}$: the completion of K with respect to the valuation determined by \mathfrak{P} .

FUNCTORS

Let G be a group, V a G -module and S a ring.

- $\text{Aut}(G)$: the group of automorphisms of G .
 $\text{Aut}(S)$: the group of automorphisms of S .
 $\text{Der}(G, V)$: the group of derivations of G into V .
 $\text{End}(G)$: the endomorphism ring of G (whenever G is abelian).
 $H^1(G, V)$: the first cohomology group of G with coefficients in V .
 $\text{Ider}(G, V)$: the group of inner derivations of G into V .
 $\text{Inn}(G)$: the group of inner automorphisms of G .
 $\text{Inn}(S)$: the group of inner automorphisms of S .

$\text{Map}(X,Y)$: the set of all maps from the set X to the set Y .

SKEW LINEAR GROUPS

Let D be a division ring and n a positive integer.

- D^n : row n -space over D .
 $D^{n \times n}$: the ring of $n \times n$ matrices over D .
 $\dim_D V$: the dimension of a D -space V over D .
 $\text{diag}(X_1, \dots, X_m)$: the set of diagonal matrices with diagonal entries from the appropriate sets X_i .
 $(D:E)_r$: the right dimension of D over its division subring E .
 $GL(n,D)$: the group of invertible $n \times n$ matrices over D .
 $SL(n,D)$: the special linear group (see page 154).
 $\text{Tr}_1(n,D)$: the subgroup of $GL(n,D)$ of lower unitriangular matrices.
 $\text{Tr}^1(n,D)$: the subgroup of $GL(n,D)$ of upper unitriangular matrices.

Let G be a skew linear group and g an element of G .

- G^- : see page 81.
 G^+ : see page 81.
 $\mathfrak{g}_u, \mathfrak{g}_d$: Jordan constituents of \mathfrak{g} (see page 83).
 G_u, G_d : see page 85.
 $s(G)$: see page 21.
 $u(G)$: see page 21.
 G^0 : the connected component of the identity of the linear group G .

SPECIAL SYMBOLS

Let n be an integer.

- $[n]$: the greatest integer less than or equal to n .
 $-[-n]$: the least integer greater than or equal to n .
 $c(n,q)$: see page 113.
 $e(n,q)$: see page 112.
 $\beta(n)$: a Jordan function (see page 151).
 $\gamma(n,s)$: see page 47.

- π' : the set of primes not in the set π .
 $\phi(n)$: the Euler function.
 ω : the first infinite ordinal.
 \varinjlim : the direct limit.
 \oplus : the direct sum.
 \otimes_R : the tensor product over a ring R .

AUTHOR INDEX

- A
- Amitsur, S. A., 44, 46, 48, 69, 72.
 Artin, E., 10, 11, 225.
 Auslander, L., 29.
- B
- Bachmuth, S., 161.
 Banieqbal, B., 72.
 Baumslag, G., 38.
 Birkhoff, G., 162, 164.
 Brown, K. A., 123, 125.
 Bruck, R. H., 21.
 Bushnell, C., 59.
- C
- Černikov, S. N., 92, 97.
 Chevalley, C. C., 70, 83.
 Cliff, G., 28.
 Clifford, A. H., 3, 4, 9, 11, 22, 94, 95, 104, 109, 192, 193, 211, 221.
 Cohn, P. M., 37, 38, 162.
- D
- Dickson, L. E., 151, 152, 153.
 Dietzmann, A. P., 110.
 Dieudonne, J., 154.
 Dirichlet, G. Lejeune-, 77, 153.
 Dunwoody, M. J., 36.
- F
- Farkas, D. R., 28.
 Faudree, R. J., 75.
 Feit, W., 72.
 Formanek, E., 12.
- G
- Goldie, A. W., 23, 25, 35, 67, 122, 123, 126, 136, 137, 163, 208, 211, 215, 216.
 Gorenstein, D., 72.
 Green, A. J., 44.
 Gruenberg, K. W., 31, 120.
- H
- Hall, P., 18, 26, 28, 31, 35, 89, 132, 135, 220.
 Harada, K., 72.

Hartley, B., 23, 67, 71, 72, 74,
 219, 224, 226.

Hasse, H., 59.

Heineken, H., 21.

Herstein, I. N., 44, 45.

Higman, G., 24, 28, 181.

Hilbert, D., 134.

Hirsch, K. A., 217.

I

Ihara, Y., 162.

J

Jacobson, N., 220.

Janusz, G. J., 65.

Jategaonkar, A. V., 12.

Jordan, C., 69, 74, 83, 151, 173,
 174, 175.

K

Kaplansky, I., 64, 221.

Klein, F., 63.

Kolchin, E. R., 83, 106.

Krull, W., 148.

Kuroš, A. G., 37.

L

Levič, E. M., 220.

Levitzki, J., 20, 130.

Lewin, J., 38.

Lewin, T., 38.

Lichtman, A. I., 28, 35, 36, 122,
 129, 130, 150, 151, 153, 154,
 155, 159, 161, 164, 165.

Lie, S., 83, 106.

Lorenz, M., 13, 14.

Lyndon, R. C., 29.

M

Mal'cev, A. I., 66, 73, 76, 77, 99,
 129, 152, 174.

Maschke, H., 3.

Menal, P., 23.

Mochizuki, H. Y., 20, 161.

Musson, I. M., 220.

N

Noether, E., 152, 176, 178, 193.

O

Ore, O., 25, 28.

P

Passman, D. S., 185, 226.

Platonov, V. P., 28, 105.

Plotkin, B. I., 217.

Poincaré, H., 162, 164.

R

Remak, R., 29.

Robson, J. C., 212.

Roquette, P., 65.

Roseblade, J. E., 118, 124, 125,
 135, 143, 144, 184, 220.

S

- Sanov, I. N., 20.
 Schur, I., 3, 4, 57, 74, 78, 86,
 96, 106, 158, 173, 200, 206,
 207.
 Shahabi-Shojaei, M. A., 67, 71,
 72, 74.
 Shirvani, M., 45, 47, 75.
 Skolem, T., 176, 178, 193.
 Small, L. W., 133.
 Smith, P. F., 133, 143, 144, 184.
 Snider, R. L., 14, 26, 28, 29,
 207, 210, 219, 220, 222, 223.
 Solitar, D., 38.
 Solomon, L., 65.
 Stafford, J. T., 212.
 Stewart, I. A., 120, 218.
 Šunkov, V. P., 78.
 Suprunenko, D. A., 20.

T

- Thomas, S., 170.

Thompson, J. G., 72.

- Tits, J., 28, 72, 122, 154, 155,
 159, 161.

W

- Wedderburn, J. H. M., 10, 11, 45,
 65, 225.
 Wehrfritz, B. A. F., 4, 5, 6, 7, 8,
 27, 32, 68, 80, 83, 86, 93, 97,
 99, 102, 104, 110, 111, 112,
 113, 114, 118, 123, 125, 128,
 138, 145, 169, 172, 174, 176,
 178, 192, 195, 196, 198, 199,
 203, 205, 206, 207, 208, 209,
 211, 215, 217, 218, 219, 220,
 223.
 Winter, D., 66.
 Witt, E., 162, 164.

Z

- Zalesskii, A. E., 66, 67, 68, 69,
 74, 77, 79, 80, 83, 86, 87, 92,
 108, 121, 184, 185, 187, 189,
 190.
 Zassenhaus, H., 51, 52, 57, 78,
 99, 106.

GENERAL INDEX

A

Abelian group, 4, 5, 19, 22, 29, 30, 31, 42, 45, 68, 73, 79, 94, 98, 109, 166, 174, 176, 177, 178, 179, 180, 192, 195, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 210, 217, 218, 221, 222, 223, 226; *poly torsion-free*, 26, 133, 148, 193, 194, 203; *of finite exponent*, 27; *reduced*, 192.

Absolutely irreducible group, 10, 11, 15, 16, 17, 29, 79, 166 *et seq.*

Artinian ring, 12, 15, 17, 181, 219; *locally*, 11; *locally semi-simple*, 5; *semisimple*, 6, 7, 8, 9, 11, 12, 14, 15, 79, 84, 126, 141, 144, 176 *et seq.*, 216; *simple*, 7, 8, 10, 15, 16, 64, 126.

Ascendant subgroup, 116.

B

Baer group, 117, 118, 119, 199.

Baer radical, 116, 118, 120.

Binary icosahedral group, 47, 51, 63, 72, 76.

Binary octahedral group, 47, 54, 75.

Bounded, n -, (m,n) -, 169.

Brauer group, 48.

C

Central endomorphism dimension, 219.

Centrally erimitic group, 139.

Centre by finite group, 200.

Centre by locally-finite group, 207, 209, 215.

Centre by periodic group, 87, 199, 200, 208.

Completely reducible group, 1, 4, 5, 6, 7, 8, 9, 11, 22, 81, 104, 211.

Crossed product, 23, 24, 25, 27, 32, 34, 37, 58, 59, 134, 141, 142, 143, 148, 149, 155, 181 *et seq.*

Cyclic algebra, 59.

D

d -element, 84, 87.

Diagonalizable element, 83.

Discrete valuation ring, 148, 149.

Divisor set, 157, 203.

E

Endomorphism dimension, 219.

Engel element, 116, 120.

Exponent (of an algebra), 48, 49.

F

Finite-dimensional algebra, 4, 5, 45, 48, 49 *et seq.*, 64, 65, 68, 84.

Finite group, 19, 22, 44 *et seq.*, 67 *et seq.*

Finite residual (of a group), 96.

Fir, 37.

Fitting group, 89, 117, 119, 199.

Fitting subgroup, 116, 118, 120.

Frattni subgroup, 140.

Frobenius complement, 45, 46.

G

Generalized nilpotent group, 114.

Generalized soluble group, 82, 208 *et seq.*, 216.

Goldie dimension, *see* uniform dimension.

Goldie ring, 126, 208, 211, 216.

Group of finite exponent, 167, 174.

Group ring/algebra, 26, 28, 33, 34, 36, 37, 122, 143, 147, 150, 161, 185, 186, 187, 189, 191, 219.

Gruenberg group, 31, 93, 119.

Gruenberg radical, 116, 118, 120.

H

Hirsch number/length, 129, 138.

Hirsch-Plotkin height, 99.

Hirsch-Plotkin radical, 116, 120, 140, 190, 218.

Hyperabelian group, 19, 32, 95, 97, 98, 99, 210, 217.

Hyperabelian height, 99.

Hypercentral group, 80, 92, 93, 111, 117, 119, 121, 209.

Hypercyclic group, 120, 121, 218.

Hyper FC-central group, 186, 187, 188, 210.

I

Ideal, *annihilator-free*, 185, 186, 187, 191, 205; *Artin-Rees*, 133, 143, 144; *completely prime*, 123, 125; *G-prime*, *G-semiprime*, 191; *maximal*, 134, 135, 140, 148, 149, 160, 222; *prime*, 48, 49, 123, 124, 128, 134, 141, 189, 191; *semi-prime*, 191.

\bar{I} -group, *see* Locally indicable group.

Irreducible group, 1, 5, 6, 7, 8, 9, 10, 11, 15, 39, 202, 213, 219.

Irreducible module, 3, 4, 39, 64, 65, 68, 135, 220, 222.

J

Jacobson radical, 158, 222.

Jordan decomposition, 83, 84.

Jordan function, 151.

L

- Lie algebra, 162 *et seq.*
- Locally Artinian ring, 11.
- Locally finite dimensional algebra, 4, 5, 6, 7, 11, 19, 22, 29, 30, 32, 33, 67, 77, 79, 80 *et seq.*, 199 *et seq.*, 216.
- Locally finite group, 9, 11, 14, 19, 29, 30, 31, 44, 64, 65, 66, 67, 73 *et seq.*, 81, 86, 87, 107, 108, 111, 114, 118, 130, 151, 166, 174, 189, 192 *et seq.*, 199, 204, 206, 208, 210, 217, 218, 219, 224 *et seq.*
- Locally indicable group, 35.
- Locally nilpotent group, 19, 26, 33, 73, 80, 85, 86 *et seq.*, 113, 119, 166, 174, 190, 197, 198, 199, 201, 203, 208, 210, 211, 215, 217, 223.
- Locally polycyclic group, *see* polycyclic group.
- Locally semisimple ring, *see* Artinian.
- Locally soluble group, 19, 31, 32, 35, 37, 74, 82, 95 *et seq.*, 106, 108, 112, 115, 218.
- Locally supersoluble group, *see* supersoluble group.

M

- Maximal condition, *on annihilators*, 14, 211; *on centralizers*, 22.
- Metabelian group, 67, 69, 71, 74, 77, 78, 79, 89, 93, 179, 195, 196, 197, 198, 199, 201.
- Minimal condition, *on p-subgroups*, 74, 78.

N

- Nilpotent group, 22, 23, 65, 68, 91, 95, 131, 138, 154, 165, 174, 189, 197, 198.
- Nilpotent radical, 148.
- Nilring, 20.
- Noetherian, 12, 14, 122, 133, 143; *locally*, 25.
- Normalizing basis, 155 *et seq.*
- Normalizing extension, 12.

O

- Orbitally sound group, 124, 127.
- Ordered group, 32, 33, 37, 214, 215, 218.
- Ore, *domain*, 25, 26, 28, 34, 37, 148, 149, 162, 215; *subring*, 212, 213; *subset*, 133, 148, 149, 157, 158, 203.
- \mathbb{O}_F -algebra, 162, 164.
- \mathbb{O} -group, 26, 27, 31, 34, 37.
- \mathbb{O}_1 -group, 34, 35, 37, 149, 151.
- \mathbb{O}_2 -group, 37.

P

- Paraheight, 120.
- Periodic group, 4, 5, 27, 130, 138, 151, 153, 154, 164, 168, 169, 171, 172, 174, 180, 181, 192, 194, 197, 199, 200, 203, 205, 206, 207, 208, 209, 210, 215, 217, 218.
- Persistent subgroup, 15, 16, 17.
- Plinth, 135, 140, 141, 160.

- p -nilpotent group, 143.
- Polycyclic group, 27, 122 *et seq.*, 147, 159, 160, 223; *locally*, 28, 31, 34, 98, 130, 155, 202; *residually*, 37, 147.
- Polyplinthic group, 142, 143.
- Primary group, 86, 87, 88, 89, 91, 92, 93, 100.
- Prime ring, 9, 15, 16, 190, 205, 212.
- Prime subgroup, 15, 16, 17.
- Primitive ring, 219.
- Primitivity, 4.
- Procyclic group, 193.
- Prüfer group, 67, 75, 90, 91, 111, 174, 181.
- Q**
- Quasisimple group, 71, 72, 169.
- Quaternion algebra, 49, 50, 69, 110.
- Quaternion group, 45, 46, 47, 50, 53, 54, 56, 57, 69, 73, 75, 88, 90, 102, 110, 111, 113.
- R**
- Radical group, 31, 32, 83, 99, 217.
- Ramification index, 49.
- Rank (Prüfer) of a group, 4, 42, 70, 73, 167, 176, 177, 179, 192, 194, 195, 218.
- Reducible group, 1, 2, 5, 38.
- Regular element, 23, 24, 140, 141, 156.
- Representation, 2, 3.
- Residual finiteness, 129 *et seq.*, 150, 176, 178, 179, 192, 195, 198, 220; *of prime power order*, 138, 139.
- Residually nilpotent group, 36, 37, 138 *et seq.*, 147, 150, 216.
- Residually soluble group, 31, 32.
- Residue degree, 49.
- Ring of quotients, 25, 122, 126, 133, 147, 148, 149, 153, 161, 213.
- S**
- \bar{S} -group, 82, 172, 174, 199, 217.
- Schur index, 48, 49, 63 *et seq.*, 68.
- Semiprime ring/algebra, 8, 9, 11, 126, 134, 208, 211, 212, 216.
- Semisimple element, 84.
- Semisimple ring, *see* Artinian.
- Simple group, 168, 169; *finite*, 70; *infinite*, 174, 197.
- Simple ring, 182; *also see* Artinian.
- Skew group ring, 25, 27, 164, 193, 194, 197.
- SL(2,3), 47, 54, 63, 76.
- SL(2,5), *see* binary icosahedral group.
- Soluble group, 27, 28, 31, 32, 36, 53, 57, 82, 100, 102, 105, 120, 121, 132, 158, 166, 172, 194, 202 *et seq.*, 219, 223.
- Stability subgroup, 2, 3, 17, 18, 19, 20, 21, 23, 66, 80, 130, 151, 164.
- Super-residually \bar{X} -group, 176.

Supersoluble group, 120; *locally*,
 120, 121.

Support, 23.

Sylow subgroup, 34, 45, 46, 65,
 66, 68, 70, 74, 78, 79, 105,
 110.

U

\underline{U} -group, 18, 19, 22.

Ultraproduct, 36.

Uniform dimension, 211.

Unipotent, *element*, 17 *et seq.*,
 83, 84; *group*, 2, 17 *et seq.*,
 80, 82, 97, 104, 105, 106,
 129, 130, 151, 164, 222.

Unitriangularizable group, 2, 23,
 100.

Universal enveloping algebra,
 162 *et seq.*

W

Wreath product, 29, 31, 72, 102,
 110, 111, 113, 128, 132, 170,
 174, 197, 202.

X

X-group, 147, 150, 153, 154, 161.

\underline{X}_F -group, 220, 221.

Y

\underline{Y}_F -group, 219, 220, 221, 223,
 224.

Z

Zaleskii subgroup, 188.

Zariski topology, 81, 82.

\underline{Z}_F -group, 219, 220, 221, 222,
 223, 224, 226.