

---

## Index

---

- $(R, k)$ -map, 24
- $(R, q)_{gen}$ -polycycle, 73
- $\{4, 3\} - v$ -replacement, 196
- $\{a, b, k\}$ -map, 24
- $\{a, b, k\}$ -plane, 24
- $\{a, b, k\}$ -polyhedron, 24
- $\{a, b, k\}$ -sphere, 24
- $\{a, b, k\}$ -torus, 24
- $(a-b)$ -edge, 24
- $(r, q)$ -filling of a boundary, 56
- $(r, q)$ -graph, 122
- $(r, q)$ -helicene, 49
- $(r, q)$ -map, 55
- $(r, q)$ -polycycle, 43
- $(r, q)$ -star, 64
- $(r, q)_{gen}$ -polycycle, 53, 54
- 2-embeddable graph, 121
- 2-homeohedral tiling, 143
- 2-isohedral polyhedra, 126
- 2-periodic plane graph, 8
- 4-triakon operation, 22
- 5-triakon operation  $T$ , 22
- $APrism_m$ , 19
- $Bundle_m$ , 18
- $C_3$ -replacement, 285
- $E_1$ -replacement, 285
- $Prism_m$ , 19
- $k$ -connected graph, 1
- $k$ -inflation operation, 31
- $k$ -valent graph, 2
- $m$ -halving operation, 22
- $p$ -vector of a map, 2
- $v$ -vector of a graph, 2
  
- adjacency of vertices, 2
- agglomeration of polycycles, 74
- alternating zone, 122
  
- antipodal quotient, 5
- Archimedean polyhedron, 21
- Archimedean tiling, 21
- automorphism group, 1
- automorphism of a graph, 1
- automorphism of a map, 7
- automorphism of a polycycle, 44
- azulenoid, 25
  
- balanced plane tiling, 146
- boundary edge, 3
- boundary of a map, 3
- boundary sequence of a polycycle, 56
- bridge of a polycycle, 74
  
- capping operation, 21
- capsid of a virus, 28
- Cartesian product, 1
- Catalan polyhedron, 21
- cell-complex, 3, 43
- cell-homomorphism of maps, 7
- central circuit in an Eulerian map, 34
- central symmetry inversion group, 13
- chamfered Dodecahedron, 31
- chamfering operation, 31
- circle-packing representation of a map, 10
- circuit  $C_n$ , 2
- closed map, 3
- coherent cutting, 152
- complete graph  $K_n$ , 2
- connected graph, 1
- convex  $(r, q)$ -polycycle, 51
- convex cut of a polycycle, 122
- corona of a face, 24
- corona of a vertex, 24
- covering of a map, 8

- cross-cap of a surface, 5  
 Cube  $\{4, 3\}$ , 18  
 curvature of a surface, 10  
  
 deck automorphism, 8  
 decorated  $\{r, q\}$ , 21  
 degree of a vertex, 1  
 deltahedron, 21  
 density of a polycycle, 108  
 Dodecahedron  $\{5, 3\}$ , 18  
 dual map  $M^*$ , 3  
  
 edge of a graph, 1  
 elementary polycycle, 74  
 elliptic pair  $(r, q)$ , 43  
 elongation operation, 22  
 equivelar polyhedron, 55  
 Euler formula for  $k$ -valent maps, 9  
 Euler formula for tiling, 146  
 Euler-Poincaré characteristic, 9  
 Eulerian map, 34  
 extensible polycycle, 76  
 exterior face of a plane graph, 2  
 extremal polycycle, 108  
  
 face of a map, 2  
 fixed-point-free automorphism, 7  
 flag of a map, 4  
 Frank-Kasper map, 218  
 fullerene, 25  
 fulleroid, 284  
 fundamental domain, 16  
 fundamental group, 6  
  
 genus of a map, 6  
 girth of a graph, 50  
 Goldberg-Coxeter construction  $GC_{k,l}$ , 28  
 gonality of a face, 2  
 graph, 1  
  
 half edge, 292  
 Hamming distance, 121  
 handle of a surface, 5  
 helicene, 45  
 hexagonal tiling  $\{6, 3\}$ , 19  
 hole of a polycycle, 54  
 homology group, 9  
 homotopic path, 6  
 hyperbolic pair  $(r, q)$ , 43  
 hypercube, 121  
  
 Icosahedron  $\{3, 5\}$ , 18  
 incidence, 2  
  
 induced polycycle, 45  
 induced subgraph, 1  
 inner dual of a polycycle, 44  
 inscribe a Dodecahedron, 241  
 interior face, 2  
 interior vertex, 54  
 isogonal  $(r, q)$ -polycycle, 64  
 isohedral  $(r, q)$ -polycycle, 64  
 isolated pentagon rule, 170  
 isomorphism of maps, 7  
 isotoxal  $(r, q)$ -polycycle, 64  
  
 kernel of a polycycle, 79  
 kernel-elementary polycycle, 79  
 Klein bottle  $\mathbb{K}^2$ , 6  
  
 Laves tiling, 21  
 leapfrog map, 31  
 local isomorphism, 7  
 locally finite plane graph, 4  
  
 Möbius strip, 5  
 major skeleton of a polycycle, 107  
 map, 3  
 master polygon, 29  
 matching of a graph, 2  
 medial map, 30  
 minimal surface, 144  
 minimal torus, 8  
 modular group  $PSL_2(\mathbb{Z})$ , 17  
 mosaic tiling, 21  
  
 normal plane tiling, 145  
  
 Octahedron  $\{3, 4\}$ , 18  
 open edge of a polycycle, 74  
 orbit space, 292  
 orbit tiling, 292  
 oriented map, 5  
 outer dual of a polycycle, 44  
 outerplanar polycycle, 43  
  
 parabolic pair  $(r, q)$ , 43  
 path  $P_n$ , 2  
 path distance of a graph, 121  
 pentacon operation  $P$ , 22  
 perfect matching of a graph, 2  
 perimeter of a polycycle, 108  
 planar graph, 2  
 plane dual graph, 2  
 plane graph, 2  
 plane symmetry group, 13  
 point group, 12

polyamond, 45  
 polycycle, 43  
 polycyclic hydrocarbon  $C_nH_m$ , 73  
 polycyclic realization of a graph, 43  
 polyhedron, 10  
 polyhex, 45  
 polyomino, 45  
 primal-dual circle representation  
     of a map, 11  
 projective plane  $\mathbb{P}^2$ , 5  
 proper polycycle, 45  
  
 quotient map, 7  
  
 railroad in a 3-valent plane graph, 33  
 railroad in a 4-valent plane graph, 34  
 reciprocal polycycle, 45  
 regular map, 18  
 regular-faced polyhedron, 21  
 Riemann surface, 10  
  
 Schlegel diagram, 10  
 simple graph, 1  
 simply connected map, 6  
 single ring, 136  
 skeleton of a polycycle, 43  
 skeleton of a polyhedron, 10  
 snub  $\{b, 3\}$ , 72  
 snub  $A\text{Prism}_m$ , 20  
 snub  $\text{Prism}_m$ , 20  
 special perfect matching of  $\{3, 6\}$ , 153, 231

sphere  $\mathbb{S}^2$ , 4  
 square tiling  $\{4, 4\}$ , 19  
 squaring of a torus, 152  
 strict polygonal graph, 55  
 strictly face-regular  $(\{a, b\}, k)$ -map, 125  
 strip group, 13  
 symbolic sequence, 208  
  
 Tetrahedron  $\{3, 3\}$ , 18  
 tight 3-valent plane graph, 33  
 tight 4-valent plane graph, 34  
 torus  $\mathbb{T}^2$ , 6  
 totally elementary polycycle, 84  
 tree, 107  
 triangle group  $T^*(l, m, n)$ , 16  
 triangle rotation group  $T(l, m, n)$ , 17  
 triangular tiling  $\{3, 6\}$ , 19  
 triangulation, 29  
 truncation operation, 21  
 two-faced map, 24  
  
 universal cover of a map, 8  
  
 vertex of a graph, 1  
 vertex-split Icosahedron, 47  
 vertex-split Octahedron, 47  
  
 wallpaper group, 14  
 weakly face-regular  $(\{a, b\}, k)$ -map, 181  
  
 zigzag in a plane graph, 32