Index

Bindschadler, 4, 79, 114
Brenton, 4, 79, 114
Brieskorn, 105
Burns, 28

Cartan, 28
Cayley, 2, 3
characteristic element, 41, 127
compactifications of affine surfaces, 114
Coxeter, 2
cubic surface, 2

del Pezzo surface, 1
  degree of, 2, 108
  Gorenstein, 2
    classification, 104, 108
  non-singular, 2
Demazure, 3
discriminant forms technique, 117
divisor
  big and nef, 13
  nef, 13
Dolgachev, 35
DPN pair, 20
  classification, 89
  right, 20
DPN surface, 4, 20
  classification, 89
  Du Val part of, 8, 61
  elliptic type, 48
  extremal, 48, 60
  hyperbolic type, 49
  logarithmic part of, 8, 61
  parabolic type, 48
  right, 20
  standard, 44
  super-extremal, 69
    classification, 70
  varying part of, 9, 62
Drucker, 4, 79, 114
Du Val, 2, 3
Du Val part, 61
  of DPN surface, 8, 61, 90
  of graph, 8
Dynkin diagram, 50

edge
  broken, 51
    weight of, 51
  simple, 51
    weight of, 51
  thick, 51
  weight of, 90
Eichler, 121
embedding of lattices
  existence, 120
  primitive, 120
  uniqueness, 121
Enriques surface, 22, 35
exceptional curve, 14, 21
  1st kind, 15
exceptional curves of
  cubic surface, 2
  DPN surface, 14, 32
  index 1 del Pezzo, 4
  K3 surface, 24
  log del Pezzo index ≤ 2, 9, 32
  plane sextic, 102
  surface, 3, 21

finite form
  2-elementary, 123
    canonical form, 123
  elementary, 119

quadratic, 117
signature mod 8 of, 119
symmetric bilinear, 118

Global Torelli Theorem, 25
graph (dual) of exceptional curves, 3, 89

Hidaka, 3

Jordan decomposition, 119

K3 surface, 22
automorphism group, 25
nef cone, 24
faces of, 23
non-symplectic involution, 22
period domain, 27
periods, 25
abstract, 26
with condition on Picard lattice, 27
general, 27
K3 surface with involution, 29
classification, 60, 63
elliptic type, 48
exceptional classes, 33
extremal, 48, 60
hyperbolic type, 49
main invariant, 29
main invariants, 30
parabolic type, 48
root invariant of, 40
standard, 44
super-extremal, 69
classification, 70
Kawamata, 13
Kleiman's criterion, 12, 105
Kleiman-Mori cone, 12
of DPN surface, 91
Kneser, 121
Kulikov, 4, 26

Lannér, 133
lattice, 117
2-elementary, 30, 122
classification, 124
determinant of, 118
discriminant form of, 118
discriminant group of, 118
even, 117
existence, 120
genus of, 119
spinor, 121
odd, 117
p-adic elementary, 119
signature of, 119
unimodular, 118
uniqueness, 121
log del Pezzo surface, 1, 13
Gorenstein, 2
classification, 104, 108
index ≤ 2, 1
classification, 104
extremal, 9, 48, 60
main invariant, 29
main invariants, 6, 30
without Du Val singularities, 9, 110
logarithmic part, 61
of DPN surface, 8, 61, 90
of graph, 8, 61

main invariant, 29, 30
classification, 31, 124
Miranda, 110
Miyaoka, 13
moduli space of
del Pezzo surfaces, 48
dimension, 115
K3 surfaces, 28
with condition on Picard lattice, 29
Mori Theory, 106
Mumford, 13

Nakai-Moishezon criterion, 105

overlattice, 120

Persson, 110
Piatetsky-Shapiro, 4, 25

Rapoport, 28
Riemann relations, 26
Riemann-Roch Theorem, 23
right resolution, 6, 18
root invariant, 10, 40
existence, 44
generalized, 42
of root subsystem, 72

Salmon, 2, 3

Schläfli, 2
Schoutte, 2
Serre duality, 25
sextic (plane), 100
  classification, 102
Shafarevich, 4, 25
singularity
  $\mathbb{Q}$-Gorenstein, 12
  $\mathbb{Q}$-factorial, 12
  Du Val, 5
  index of, 12
  log terminal, 1, 12
  log terminal of index 2, 5, 13
  Smith Theory, 125
  Smooth divisor Theorem, 15
subset
  elliptic, 133
  hyperbolic, 133
  Lannér, 133
  parabolic, 133
surjectivity of Torelli map, 26
symmetric domain of type IV, 28

Table 1, 52
Table 2, 64
Table 3, 93
Table 4, 103
Table of Lemma 3.12, 73

varying part, 62
  of DPN surface, 9, 62, 90
vertex
  black, 8, 51
  double transparent, 8, 51
  simple transparent, 8, 51
  transparent, 51
Viehweg, 13
Vinberg, 55, 130, 132
Vinberg's algorithm, 55, 129

Watanabe, 3
Witt's Theorem analogue
  for 2-elementary forms, 41, 127
  for lattices, 122