INDEX OF DEFINED TERMS

algebraic number	free space 17
interval representation, 11	<u>-</u>
order representation, 10	gate 11
real, 7	global nonnegativity problem 18
sign representation, 11	0 0 0
AND-OR tree 15	invariant 6
atomic formula 2	
auxiliary polynomial 12	$_{ m map}$
administ polynomial 12	semialgebraic, 5
Betti number	matrix 2
higher-order, 7	multivariate decomposition 12
Betti number 7	•
BKR-algorithm 9	offset
Ditti-aigorithm 5	surface, 17
CAD 7, 12, 13	,
cell 6	polynomial for α 8
$\delta(i)$ -cell, 6	minimal, 8
decomposition, 6	prefix 2
dimension, 6	prenex Tarski formula 2
· · · · · · · · · · · · · · · · · · ·	principal subresultant coefficient 12
cellular decomposition 6	Puiseux series 14
Collins's algorithm 14	Tubeux series II
configuration space 17	quantifier elimination problem 3
cylindrical algebraic decomposition 7, 12, 13	quantinoi onimination problem o
decomposition	real algebraic number 7, 8
cellular, 6	degree of, 8
	real algebraic set 5
cviingrical algebraic / 12 13	rear argeoraic set 5
cylindrical algebraic, 7, 12, 13	resultant 12
semialgebraic, 6	resultant 12
semialgebraic, 6 sum-of-squares, 19	<u> </u>
semialgebraic, 6 sum-of-squares, 19 univariate, 11	resultant 12
semialgebraic, 6 sum-of-squares, 19 univariate, 11 degree	resultant 12 roadmap 17
semialgebraic, 6 sum-of-squares, 19 univariate, 11 degree of real algebraic number, 8	resultant 12 roadmap 17 sample point 6 section 12
semialgebraic, 6 sum-of-squares, 19 univariate, 11 degree	resultant 12 roadmap 17 sample point 6 section 12 sector 12
semialgebraic, 6 sum-of-squares, 19 univariate, 11 degree of real algebraic number, 8 discriminant 12	resultant 12 roadmap 17 sample point 6 section 12 sector 12 semialgebraic decomposition 6
semialgebraic, 6 sum-of-squares, 19 univariate, 11 degree of real algebraic number, 8	resultant 12 roadmap 17 sample point 6 section 12 sector 12 semialgebraic decomposition 6 semialgebraic map 5
semialgebraic, 6 sum-of-squares, 19 univariate, 11 degree of real algebraic number, 8 discriminant 12 envelope method 17	resultant 12 roadmap 17 sample point 6 section 12 sector 12 semialgebraic decomposition 6 semialgebraic map 5 semialgebraic set 5
semialgebraic, 6 sum-of-squares, 19 univariate, 11 degree of real algebraic number, 8 discriminant 12 envelope method 17 first-order theory of reals 1	resultant 12 roadmap 17 sample point 6 section 12 sector 12 semialgebraic decomposition 6 semialgebraic map 5 semialgebraic set 5 connected component of, 6
semialgebraic, 6 sum-of-squares, 19 univariate, 11 degree of real algebraic number, 8 discriminant 12 envelope method 17 first-order theory of reals 1 decision problem, 1, 3	resultant 12 roadmap 17 sample point 6 section 12 sector 12 semialgebraic decomposition 6 semialgebraic map 5 semialgebraic set 5 connected component of, 6 decomposition of, 6
semialgebraic, 6 sum-of-squares, 19 univariate, 11 degree of real algebraic number, 8 discriminant 12 envelope method 17 first-order theory of reals 1 decision problem, 1, 3 existential problem, 3	resultant 12 roadmap 17 sample point 6 section 12 sector 12 semialgebraic decomposition 6 semialgebraic map 5 semialgebraic set 5 connected component of, 6 decomposition of, 6 semidefinite programming (SDP) 19
semialgebraic, 6 sum-of-squares, 19 univariate, 11 degree of real algebraic number, 8 discriminant 12 envelope method 17 first-order theory of reals 1 decision problem, 1, 3 existential problem, 3 quantifier elimination, 1	resultant 12 roadmap 17 sample point 6 section 12 sector 12 semialgebraic decomposition 6 semialgebraic map 5 semialgebraic set 5 connected component of, 6 decomposition of, 6 semidefinite programming (SDP) 19 sign 6
semialgebraic, 6 sum-of-squares, 19 univariate, 11 degree of real algebraic number, 8 discriminant 12 envelope method 17 first-order theory of reals 1 decision problem, 1, 3 existential problem, 3 quantifier elimination, 1 footprint 17	resultant 12 roadmap 17 sample point 6 section 12 sector 12 semialgebraic decomposition 6 semialgebraic map 5 semialgebraic set 5 connected component of, 6 decomposition of, 6 semidefinite programming (SDP) 19 sign 6 assignment, 6
semialgebraic, 6 sum-of-squares, 19 univariate, 11 degree of real algebraic number, 8 discriminant 12 envelope method 17 first-order theory of reals 1 decision problem, 1, 3 existential problem, 3 quantifier elimination, 1 footprint 17 formal derivative 9	resultant 12 roadmap 17 sample point 6 section 12 sector 12 semialgebraic decomposition 6 semialgebraic map 5 semialgebraic set 5 connected component of, 6 decomposition of, 6 semidefinite programming (SDP) 19 sign 6 assignment, 6 class, 6
semialgebraic, 6 sum-of-squares, 19 univariate, 11 degree of real algebraic number, 8 discriminant 12 envelope method 17 first-order theory of reals 1 decision problem, 1, 3 existential problem, 3 quantifier elimination, 1 footprint 17	resultant 12 roadmap 17 sample point 6 section 12 sector 12 semialgebraic decomposition 6 semialgebraic set 5 connected component of, 6 decomposition of, 6 semidefinite programming (SDP) 19 sign 6 assignment, 6 class, 6 -invariant region, 10
semialgebraic, 6 sum-of-squares, 19 univariate, 11 degree of real algebraic number, 8 discriminant 12 envelope method 17 first-order theory of reals 1 decision problem, 1, 3 existential problem, 3 quantifier elimination, 1 footprint 17 formal derivative 9 formula atomic, 2	resultant 12 roadmap 17 sample point 6 section 12 sector 12 semialgebraic decomposition 6 semialgebraic map 5 semialgebraic set 5 connected component of, 6 decomposition of, 6 semidefinite programming (SDP) 19 sign 6 assignment, 6 class, 6 -invariant region, 10 variations in, 8
semialgebraic, 6 sum-of-squares, 19 univariate, 11 degree of real algebraic number, 8 discriminant 12 envelope method 17 first-order theory of reals 1 decision problem, 1, 3 existential problem, 3 quantifier elimination, 1 footprint 17 formal derivative 9 formula	resultant 12 roadmap 17 sample point 6 section 12 sector 12 semialgebraic decomposition 6 semialgebraic map 5 semialgebraic set 5 connected component of, 6 decomposition of, 6 semidefinite programming (SDP) 19 sign 6 assignment, 6 class, 6 -invariant region, 10 variations in, 8 space
semialgebraic, 6 sum-of-squares, 19 univariate, 11 degree of real algebraic number, 8 discriminant 12 envelope method 17 first-order theory of reals 1 decision problem, 1, 3 existential problem, 3 quantifier elimination, 1 footprint 17 formal derivative 9 formula atomic, 2	resultant 12 roadmap 17 sample point 6 section 12 sector 12 semialgebraic decomposition 6 semialgebraic map 5 semialgebraic set 5 connected component of, 6 decomposition of, 6 semidefinite programming (SDP) 19 sign 6 assignment, 6 class, 6 -invariant region, 10 variations in, 8

```
Sturm sequence 8
Sturm-Sylvester theorem 9
surface
    offset, 17
Tarski formula 2
    extension, 2
    prenex form, 2
Tarski sentence 2
Tarski's theorem 1
Tarski-Seidenberg theorem 6
term 2
theorem proving, geometric 18
Thom's lemma 10
_{\mathrm{tree}}
    AND-OR, 15
univariate decomposition 11
variable
    bound, 2
    free, 2
well-parallelizable\ 11
```