

Contents

Preface	III
1 Introduction	1
2 Preliminaries	5
2.1 Some basic graph notions	5
2.2 The clique-width of graphs	6
2.3 Basic graph classes of bounded clique-width	8
2.4 Tools	12
3 Graph Classes of Unbounded Clique-Width	15
3.1 Known results	15
3.2 Proof techniques	16
3.3 New graph classes of unbounded clique-width	17
3.3.1 K_4 -free co-chordal graphs	17
3.3.2 P_8 -free chordal bipartite graphs	20
3.3.3 $(P_6, \text{diamond}, K_4)$ -free weakly chordal graphs	21
3.3.4 (\mathcal{H}, p) graphs	24
3.4 Conclusion	27
4 (Chair, Co-P, Gem)-Free Graphs	29
5 Chordal Co-gem-Free and (P_5, Gem)-Free Graphs	35
5.1 Chordal co-gem-free graphs	35

5.2	Clique-width of (P_5, gem) -free graphs	43
5.3	Conclusion	44
6	(Gem, Co-gem)-Free Graphs	47
6.1	Main result	49
6.2	The Key Lemma	50
6.3	Proof of Lemma 6.2	62
6.4	Proof of Lemma 6.3	66
6.5	Proof of Lemma 6.4	68
6.5.1	Proof of Lemma 6.11	68
6.5.2	Proof of Lemma 6.12	72
6.6	Conclusion	76
7	Excluding One-Vertex P_4 Extensions	79
7.1	Classification strategy	79
7.1.1	Graph classes of unbounded clique-width	80
7.1.2	Graph classes with bounded clique-width	80
7.1.3	Structure results	82
7.2	Conclusion	85
	Appendix: Additional Proofs to Chapter 6	87
	Bibliography	105
	Index	111
	Zusammenfassung	115
	Erklärung	117
	Veröffentlichungen	119
	Lebenslauf	123