

Quadratic equations

9.1. Sums of two squares

9.2. The values of $x^2 + dy^2$

9.3. Is there a solution to a given quadratic equation?

9.4. Representation of integers by $ax^2 + by^2$ with x, y rational, and beyond

9.5. *The failure of the local-global principle for quadratic equations in integers*

9.6. Primes represented by $x^2 + 5y^2$

9.7. Additional Exercises: Questions on sums of squares

Appendix 9A. Proof of the local-global principle for quadratic equations

9.8. Lattices and quotients

9.9. A better proof of the local-global principle

Appendix 9B. Reformulation of the local-global principle

9.10. The Hilbert symbol

9.11. The Hasse-Minkowski principle

Appendix 9C. The number of representations

9.12. Distinct representations as sums of two squares

Appendix 9D. Descent and the quadratics

9.13. Further solutions through linear algebra

9.14. The Markov equation