

Rational approximations to real numbers

11.1. The pigeonhole principle

11.2. Pell's equation

11.3. *Descent on solutions of $x^2 - dy^2 = n$, $d > 0$*

11.4. Transcendental numbers

11.5. *The abc-conjecture*

11.6. Additional Exercises: Questions on Diophantine approximation

Appendix 11A. Uniform distribution

11.7. $n\alpha \bmod 1$

Kronecker's Theorem in n dimensions

11.8. Bouncing billiard balls

Appendix 11B. Continued fractions

11.9. Continued fractions for real numbers

11.10. How good are these approximations?

11.11. Periodic continued fractions and Pell's equation

11.12. Quadratic irrationals and periodic continued fractions

11.13. Solutions to Pell's equation from a well-selected continued fraction

11.14. Sums of two squares from continued fractions

Additional exercises

Appendix 11C. Two-variable quadratic equations

11.15. Integer solutions to 2-variable quadratics

Appendix 11D. Transcendental numbers

11.16. Diagonalization

11.17. The hunt for transcendental numbers

11.18. Normal numbers