

Multiplicative functions

4.1. Euler's ϕ -function

4.2. Perfect numbers. *"The whole is equal to the sum of its parts."*

4.3. Additional Exercises: Amicable, abundant, and deficient integers

Appendix 4A. More multiplicative functions

4.4. Summing multiplicative functions

4.5. Inclusion-exclusion and the Möbius function

4.6. Convolutions and the Möbius inversion formula

4.7. The Liouville function

4.8. Additional Exercises: Questions on the Liouville function and cancellation

Appendix 4B. Dirichlet series and multiplicative functions

4.9. Dirichlet series

4.10. Multiplication of Dirichlet series

4.11. Other Dirichlet series of interest

Appendix 4C. Irreducible polynomials modulo p

4.12. Irreducible polynomials modulo p

Appendix 4D. The harmonic sum and the divisor function

4.13. The average number of divisors

4.14. The harmonic sum

4.15. Dirichlet's hyperbola trick

Appendix 4E. Cyclotomic polynomials

4.16. Cyclotomic polynomials