[BR] D. Bridges and F. Richman, *Varieties of constructive mathematics*, London Math. Soc. Lecture Note Ser., vol. 97, Cambridge Univ. Press, London, 1987.

[Br] D. Bridges, *A constructive look at positive linear functionals on* $L(H)$, Pacific J. Math. **95** (1981), 11–25.

[Kr] G. Kreisel, *A notion of mechanistic theory*, Synthese **29** (1974), 11–26.

[Ku] B. A. Kushner, *Lectures on constructive mathematical analysis*, Amer. Math. Soc., Providence, R.I., 1985.

[My] J. Myhill, *A recursive function, defined on a compact interval and having a continuous derivative that is not recursive*, Michigan Math. J. **18** (1971), 97–98.

[Pe] I. G. Petrovskii, *Partial differential equations*, Wiley, Philadelphia, 1967.

[PR] M. B. Pour-El and I. Richards, *The wave equation with computable initial data such that its unique solution is not computable*, Adv. in Math. **39** (1981), 215–239.

[Ro] H. Rogers, Jr., *Theory of recursive functions and effective computability*, McGraw-Hill, New York, 1967.

[Sp] E. Specker, *Nicht konstruktiv beweisbare Sätze der Analysis*, J. Symbolic Logic **14** (1949), 145–158.

[Tu] A. M. Turing, *On computable numbers, with an application to the "Entscheidungsproblem"*, Proc. London Math. Soc. (Ser. 2) **42** (1936), 230–265; corr. ibid. **43** (1937), 544–546.

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The Riemann problem and interaction of waves in gas dynamics, by Tung Chang (Tong Zhang) and Ling Hsiao (Ling Xiao). Longman Scientific and Technical (Pitman Monographs No. 41), Essex, 1989, 272 pp. ISBN 0-582-01378-X

Many phenomena involving nonlinear wave motion fit into the mathematical framework of the so-called "hyperbolic systems of conservation laws." These are systems of nonlinear partial differential equations which describe the conservation of certain physical quantities, e.g., mass, momentum, energy, etc. The equations take the form $\operatorname{div} \phi(u) = 0$, where the divergence is with respect to the space-time independent variables, and ϕ is a nonlinear function of the unknown state variable u.

The most mathematically well-understood case is that of one