

THE EARLY MATHEMATICS OF

Leonhard Euler

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The Early Mathematics of Leonhard Euler describes Euler's early mathematical works: the 50 or so mathematical articles he wrote before he left St. Petersburg in 1741 to join the Academy of Frederick the Great in Berlin. These pieces contain some of Euler's greatest mathematics; the Königsberg bridge problem, his solution to the Basel problem, and his first proof of the Euler-Fermat theorem. It also presents important results that we seldom realize are due to Euler: that mixed partial derivatives are (usually) equal, our $f(x)$ notation, and the integrating factor in differential equations.

The book shows how contributions in diverse fields are related, how number theory relates to series, which, in turn, relate to elliptic integrals and then to differential equations. There are dozens of such strands in this beautiful web of mathematics. At the same time, we see Euler grow in power and sophistication, from a young student when at 18 he published his first work on differential equations (a paper with a serious flaw) to the most celebrated mathematician and scientist of his time.

It is a portrait of the world's most exciting mathematics between 1725 and 1741, rich in technical detail, woven with connections within Euler's work and with the work of other mathematicians in other times and places, laced with historical context.