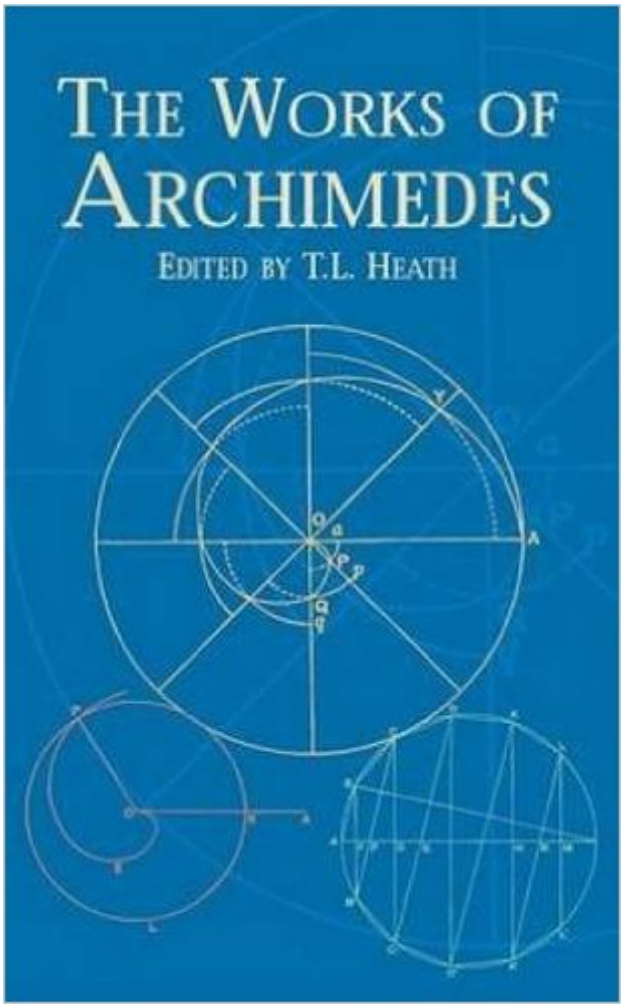
The Works Of Archimedes (Dover Books On Mathematics)



Synopsis

The complete works of antiquity’s great geometer appear here in a highly accessible English translation by a distinguished scholar. Remarkable for his range of thought and his mastery of treatment, Archimedes addressed such topics as the famous problems of the ratio of the areas of a cylinder and an inscribed sphere; the measurement of a circle; the properties of conoids, spheroids, and spirals; and the quadrature of the parabola. This edition offers an informative introduction with many valuable insights into the ancient mathematician’s life and thought as well as the views of his contemporaries. Modern mathematicians, physicists, science historians, and logicians will find this volume a source of timeless fascination. Unabridged reprint of the classic 1897 edition, with supplement of 1912.

Book Information

Series: Dover Books on Mathematics

Paperback: 326 pages

Publisher: Dover Publications (April 16, 2002)

Language: English

ISBN-10: 0486420841

ISBN-13: 978-0486420844

Product Dimensions: 5.3 x 1.1 x 8.4 inches

Shipping Weight: 1.3 pounds (View shipping rates and policies)

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Customer Reviews

Again I feel I must post a review to counter misleadinginformation in an earlier review. The author of theprevious review seems to think these works were _not_available to scholars during the Renaisance. In fact,the famous "Archimedes Palimpsest" that resurfaced inthe 1990s is only a small part of the works of Archimedesfound in this book. Moreover, this book is a reprint ofthe translation published in 1897 by Thomas L. Heath.Heath _did_ have access to the Palimpsest (or maybe toa translation into German or to a copy--of this I amunsure) and did include a translation in this book in1897. It is true that after the Palimpsest resurfacedin the 1990s and began to be examined by modern methods,some lacunae were filled in. But that’s not even mostof the Palimpsest, let alone

most of the contents ofthis book. Moreover, the newly discovered material isnot in this book (but Heath's translation of the Palimpsestis). The previous reviewer is _extremely_ confused aboutthe history.Now to the contents of the book. The famous Palimpsestactually is my favorite part. Prepare to be dazzled.Many 20th-century calculus texts, saying that integralcalculus was anticipated by Archimedes in the 3rd centuryBC, are so phrased that they may give their readersthe impression that Archimedes worked with something similarto Riemann sums, or similar nonsense. The truth is far moreinteresting. Archimedes used infinitesimals explicitly.His proofs were amazingly efficient.

I enjoyed the previous review, but do not wholly agree. It seemed to me the method of centers of gravity was the one by which Archimedes discovered, rather than proved, his results. His proofs do seem to me to involve limiting arguments which are at least reminiscent of riemann sums. Indeed even the method of centers of gravity involved slicing up solids in a way that to me suggests again riemann sums. Perhaps i have not read as carefully as the previous reviewer. I agree however that the works are startlingly wonderful and inspiring.The key to Archimedes' geometry solutions was the principle of parallel slices, that two figures all of whose slices parallel to a given reference line or plane have equal areas, or lengths, themselves have equal volume, or area. This is of course the fundamental theorem of calculus for equating areas, and the cavalieri principle, for equating volumes. Note it does not suffice to calculate them, merely to equate two such areas. thus Archimedes had to bootstrap up from one known area or volume to another.Thus starting from an actual decomposition of a cube into three pyramids, one sees that a right pyramid has volume 1/3 of cube. Then by parallel slices one sees the same for any pyramid or cone. then by taking complements one computes the volume of a sphere, by showing that horizontal slices of a cone and a sphere add up to the slice of a cylinder. Knowing cylinder and cone volume thus gives a sphere's volume.Finally one of the hard problems we give students is finding the volume of a bicylinder, the intersection of two transverse cylinders.

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