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# **A Key to Mr. Keith's Complete Measurer**

**Maynard Samuel**

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**Author: Maynard Samuel**

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# KEY

TO

## MR. KEITH'S COMPLETE MEASURER;

OR, THE

### Whole Art of Measuring:

CONTAINING

THE SOLUTIONS TO ALL THE QUESTIONS IN  
THAT WORK.

WITH REFERENCES TO THE PROBLEMS, RULES, & NOTES,  
BY WHICH THE SOLUTIONS ARE OBTAINED.

THE WHOLE TOGETHER FORMING A COMPREHENSIVE SYSTEM OF  
MENSURATION, BOTH IN THEORY AND PRACTICE, AND EX-  
PLAINED IN AN EASY AND FAMILIAR MANNER, SO THAT  
THE STUDENT MAY, IN A SHORT TIME, AND WITH  
VERY LITTLE LABOUR, OBTAIN A COMPETENT  
KNOWLEDGE OF MENSURATION.

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“Whatsoever is difficult, this teaches to overcome.”—OVID



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## PREFACE.

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**IF** an art or science is to be valued in proportion to its utility and importance in the actual concerns of human affairs, Mensuration, considered in its utmost extent, will stand pre-eminently distinguished.

Mensuration is of the highest importance in many affairs that are absolutely necessary, and in every branch of the mathematics: by its sciences are established, and commerce is conducted; by its aid we manage our business, and inform ourselves of the wonderful operations of nature; by it we measure the heavens and the earth,—for it is by the aid of Mensuration that astronomers are put into a way of making their observations, coming at the knowledge of the extent of the heavenly bodies, measures of seasons, of years, and of ages; and that geographers present at once to our view the magnitude of the whole earth, the vast extent of the seas, the divisions of empires, kingdoms, and provinces. It is from this that the architect takes his just measures for the structure of public buildings, as well as of private houses. By its help engineers conduct all their works; take the situation and plan of places; measure their distances from each other, and carry their measure into places that are only accessible to the eye. By this means we estimate the capacities of all ves-

sels, and bulks of all bodies, gauge our liquors, measure our lands, and the works of artificers, and buy and sell an infinite variety of things useful in life.

There is scarcely a writer on the different branches of education, who has not expressly recommended the study of Mensuration. An able and complete treatise on this subject was published a few years ago by Mr. KEITH, entitled, "*The Complete Measurer; or the whole Art of Measuring.*" This work contains the substance of HAWNEY'S "Measurer," (a book well known for a century past,) with the addition of about 453 new questions, (*see* Mr. Keith's Preface), with the demonstration of the Rules. It contains also a greater number of questions, and more useful matter, than any other work that has hitherto appeared; and in order that the student may judge for himself, I shall here state the several parts of which Mr. Keith's work consists:—

Part I. treats of Practical Geometry.

Part II. treats of the Mensuration of Superficies, and includes all the most useful Rules for finding the Areas of right-lined and circular Figures, with the Mensuration of the Conic Sections, the general Properties of the Ellipsis, the Parabola, and the Hyperbola; also, to find the Area of Curves by equidistant Ordinates.

Part III. treats of the Mensuration of Solids that are bounded by right or circular lines, *viz.*—Cubes, Prisms, Cylinders, Pyramids, the Sphere, the circular Spindle, &c., with the Conic Sections in general; also of the Five Regular Bodies, the Specific Gravity of Solids, and the method of ascertaining the weight and dimensions of Balls and Shells.

#### PREFACE.

Part IV. treats of the description of the Carpenter's Rule, Mensuration of Timber and of Artificers' Work, viz. Carpenters' and Joiners' Work, flooring, partitioning, roofing, and wainscoting; Bricklayers' Work, tiling or slating, walling, and chimnies; Plasterers, Painters, Glaziers, Plumbers, Masons, and Pavers' Work; with the method of ascertaining the dimensions of Vaulted and Arched Roofs, Domes, Saloons, &c. &c.

Part V. treats of the method of Gauging all kinds of Vessels used by Maltsters, Brewers, Distillers, Wine Merchants, Victuallers, &c., such as cisterns, coppers, vats, stills, casks, &c.

Part VI. treats of Land Surveying; explaining the use of the Instruments, the methods of surveying, of planning, of computing the contents, of reducing plans, of dividing the ground, of entering the field notes in the field book, and of surveying a large estate; also to survey a town or city: and likewise a large collection of useful Miscellaneous Questions in Mensuration.

The great reputation Mr. Keith's Mensuration has obtained among mathematicians and experienced teachers, renders it unnecessary, and therefore superfluous, for the Author, in this place, to say any thing further in its commendation. He therefore is of opinion, that he cannot do a more acceptable service to the public, or pay a more respectful tribute to the persevering industry, talents, and attainments, of its deceased author, than writing a Key to this very useful and important work. The solutions in this Key are in general obtained by the shortest, most simple, and most approved methods the Author could devise; but in doing this, he has closely followed Mr. Keith's Rules, and wherever a solution could be