AN INTRODUCTION TO PLANE AND SPHERICAL TRIGONOMETRY

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649489428

An Introduction to Plane and Spherical Trigonometry by A. C. Johnson

Except for use in any review, the reproduction or utilisation of this work in whole or in part in any form by any electronic, mechanical or other means, now known or hereafter invented, including xerography, photocopying and recording, or in any information storage or retrieval system, is forbidden without the permission of the publisher, Trieste Publishing Pty Ltd, PO Box 1576 Collingwood, Victoria 3066 Australia.

All rights reserved.

Edited by Trieste Publishing Pty Ltd. Cover @ 2017

This book is sold subject to the condition that it shall not, by way of trade or otherwise, be lent, re-sold, hired out, or otherwise circulated without the publisher's prior consent in any form or binding or cover other than that in which it is published and without a similar condition including this condition being imposed on the subsequent purchaser.

www.triestepublishing.com

A. C. JOHNSON

AN INTRODUCTION TO PLANE AND SPHERICAL TRIGONOMETRY



INTRODUCTION

TO

PLANE AND SPHERICAL

TRIGONOMETRY,

BY

A. C. JOHNSON, M.A.,

Naval Instructor, R.N.

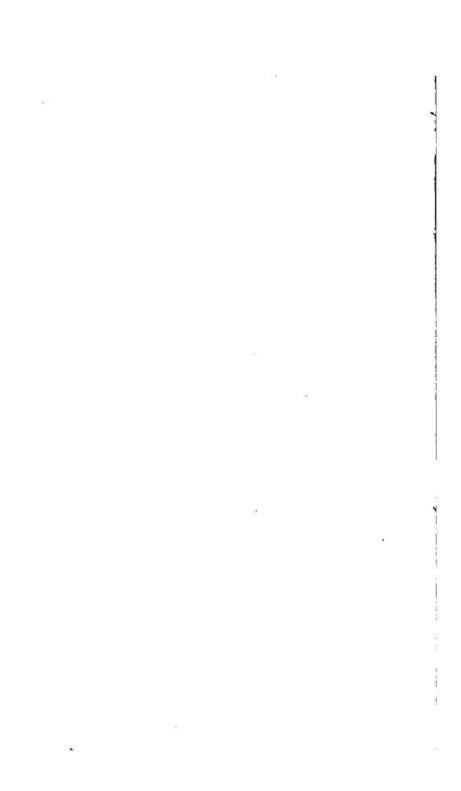
LONDON: HARRISON, 59, PALL MALL. PORTSEA: JAMES GRIFFIN. 1865.

183. e. 10.



-

THE Student is recommended, in the first instance, to make himself acquainted with Chapters I, V, and VI. He may then advance as far as page 89, and exercise himself in the Miscellaneous Problems, pages 114 to 124. After reading Chapter IV, Arts. 1 to 10, he may proceed with the Rules for the Solution of Spherical Triangles, pages 90 to 113; and the Miscellaneous Problems, pages 125 to 131; when he can turn his attention to the remaining portions of the book.

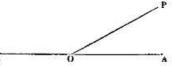


PLANE TRIGONOMETRY.

CHAPTER I.

- I. PLANE TRIGONOMETRY is that science which treats of the measurement of plane angles and triangles. As Geometry enables us to construct a triangle from three independent data, so, Trigonometry enables us, from the same data, expressed in numbers, to calculate its sides and angles.
- In Geometry, an angle is defined to be the inclination of one straight line to another, and, therefore, can never exceed two right angles. But, in Trigonometry, there is no such restriction.

For, let BOA be a fixed line, and OP a line which revolves about O, and which at first coincided with B



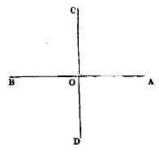
OA. Then, when OP is in the position represented in the figure, it is said to have described the angle AOP. But this mode of conceiving an angle admits of extension to angles of any magnitude; for we may suppose OP to revolve beyond OB, and so to describe an angle greater than two right angles, or, indeed, an angle of any magnitude whatever.

On the Mode of Measuring Angles.

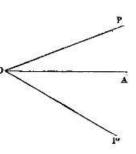
- 3. The circumference of a circle being divided into 360 equal parts, the angle at the centre subtended by one of these parts is called a degree. The degree is subdivided into 60 equal parts, called minutes; and the minute in 60 equal parts, called seconds. Degrees, minutes, and seconds are thus expressed—° "; and when an angle is said to be 20° 30' 40", we mean that it contains 20 degrees, 30 minutes, 40 seconds.
- 4. A right angle is the angle at the centre which is subtended by a quadrant, or fourth part of the circumference of a circle, and, therefore, contains 90 degrees.

An angle is frequently denoted by a single letter. Thus, in fig. 4, the angle CPN would be called P; and PCN, C, &c.

On the Use of the Signs + and -.

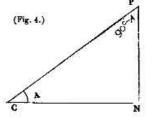


5. Let AOB, COD be two lines at right angles to each other, then those lines drawn parallel to BOA are positive, if to the right of CD, negative, if to the left: and lines drawn parallel to COD are positive, if above, negative, if below, AOB. 6. Again, suppose the line OP, by its revolution about O upwards from OA, to describe the angle AOP, and let the angles described in this manner O≤ be considered positive. Then if the line revolve downwards from OA, to describe the angle AOP', this angle will properly be accounted negative.



The Trigonometrical Ratios.

7. Let PCN be a triangle, right-angled at N, and let PCN contain any number of degrees, &c., which we may denote by A.



| - | | | | |
|---|----|---|---|--|
| | 'n | 4 | n | |
| | | | | |

| or | perp. hypoth. | is called | Sine A. |
|----|----------------------|---|--|
| or | base hyp. | ,, | Cosine A. |
| or | $\frac{perp.}{base}$ | ,, | Tangent A. |
| or | base perp. | ,, | Cotangent A. |
| or | hyp. | n | Secant A. |
| or | hyp. | " | Cosecant A. |
| | or or or or | or hypoth. base hyp. or base base perp. or base perp. hyp. base hyp. | or hypoth. is called base hyp. " or base " or base " or base " or base " or hyp. " or hyp. " or hyp. " or hyp. " |

and I - Cos. A is called Versice A.