

**GRADUATED  
EXERCISES IN PLANE  
TRIGONOMETRY**

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Graduated Exercises in Plane Trigonometry by J. Wilson & S. R. Wilson

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**J. WILSON & S. R. WILSON**

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EXERCISES IN PLANE  
TRIGONOMETRY**



GRADUATED EXERCISES  
IN  
PLANE TRIGONOMETRY,

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## PREFACE.

THE following collection of Examples is intended for the use of schools and junior students generally. The exercises are carefully graduated in difficulty, and by the constant repetition of examples on the earlier parts of Trigonometry the student will be prevented from forgetting them whilst occupied with more advanced work. Those Examples which are not original have been selected from various College and University Examination Papers, and will, we believe, be very useful in accustoming the student to the kind of work he will especially need. The knowledge of the determinant notation is now so common, that we feel we need not apologize for introducing some examples expressed in this form. A few notes are scattered through the book, calling attention expressly to theorems or modes of solution of problems which are likely to be useful. Every care has been taken to verify the answers given. A table of abbreviations is prefixed to the book to avoid repeated definitions of the same symbols.

J. WILSON.

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1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes that proper record-keeping is essential for transparency and accountability, particularly in the context of public administration and government operations. The text notes that such records serve as a critical tool for monitoring performance, identifying inefficiencies, and ensuring that resources are used effectively and ethically.

2. The second part of the document addresses the challenges associated with implementing robust record-keeping systems. It highlights the need for standardized procedures, adequate training for staff, and the use of modern technology to streamline data collection and storage. The author points out that many organizations struggle with inconsistent data entry and lack of oversight, which can lead to significant errors and mismanagement of information.

3. The third part of the document explores the role of record-keeping in decision-making and policy development. It argues that well-maintained records provide valuable insights into trends, patterns, and the impact of various initiatives. By analyzing this data, leaders can make more informed choices, allocate resources more wisely, and develop policies that are better suited to the needs of the community or organization.

4. The fourth part of the document discusses the legal and ethical implications of record-keeping. It notes that organizations have a duty to protect the privacy and confidentiality of the information they collect, while also ensuring that records are accessible to those who have a legitimate need for them. The text stresses the importance of clear policies regarding data retention, access, and disposal to avoid potential legal liabilities and maintain public trust.

5. The fifth part of the document concludes by reiterating the significance of record-keeping as a cornerstone of good governance. It calls for a commitment to continuous improvement in record-keeping practices, encouraging organizations to regularly review and update their systems to meet evolving requirements and challenges. The author expresses confidence that a strong focus on record-keeping will lead to more efficient, transparent, and accountable operations.



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## LIST OF ABBREVIATIONS.

THE following abbreviations are used in this book in problems relating to triangles:

$a, b, c$  denote the lengths of the sides  $BC, CA, AB$  respectively.

$s$  denotes the semi-sum of the sides.

$\Delta$  „ the area.

$R$  „ the radius of the circumscribing circle.

$r$  „ „ inscribed circle.

$r_a, r_b, r_c$  denote the radii of the escribed circles touching  $BC, CA, AB$  respectively.

The straight lines drawn from the angles perpendicular to the opposite sides are spoken of as the *perpendiculars*. Their lengths are denoted by  $p_a, p_b, p_c$  respectively, and their point of intersection is called the *orthocentre*.

The straight lines drawn from the angles to bisect the opposite sides are called the *bisectors* or *medians*. These must not be confounded with the bisectors of the angles of the triangle.

## GRADUATED EXERCISES

IX

### PLANE TRIGONOMETRY.

#### EXERCISE I.

1. FIND the arc subtending an angle of one degree at the centre of a circle whose radius is 4000 miles.

2. What is the circular measure of  $18^\circ$ ,  $\frac{50}{\pi}$  degrees,  $10^\circ$ , and of  $\frac{120}{\pi}$  degrees?

3. Find the measure in degrees, minutes, and seconds, of the angle subtended by an arc equal to the radius; assuming that  $\pi = 3.14159$ .

4. How many grades, minutes and seconds are there in  $54^\circ 13' 21''$ ?

5. An angle is such that the difference of the reciprocals of the numbers of degrees and grades in it is equal to its circular measure divided by  $2\pi$ ; find the angle.

6. If the three numbers which express  $A$ ,  $B$ , and  $C$ , the angles of a triangle, are all equal, the unit of measurement of  $A$  being a degree, of  $B$  a grade, and of  $C$  an angle equal to the sum of a degree and a grade; express each of the angles in circular measure,