



Analytic Geometry by Maria M. Roberts; Julia T. Colpitts
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A First Trigonometry. By WINIFRED WADDELL and D. K. PICKEN. Pp. vii + 78. 1919. (Melville & Mullen, Melbourne.)

A very sound and clearly written text-book. The introductory chapter is intended mainly for the teacher. The seven chapters which follow deal with the Trigonometric Ratios of an acute angle, their graphs, Use of Pythagoras' Theorem, Use of Trigonometric Tables, Practical Applications, Geometrical Applications, Generalisation of Angles and Trigonometric Functions. Those who advocate the early introduction of easy numerical Trigonometry will not find here a text-book suited to their purpose, but it would be most valuable at a later stage to fix ideas and make a sure foundation, before further building. The authors express the projection of AB on a line inclined at an angle C as $\cos C \cdot AB$, insisting that the numerical factor $\cos C$ should precede AB . Perhaps the expression " $\cos C$ " ought to be regarded as objectionable.

Analytic Geometry. By MARIA M. ROBERTS and JULIA T. COLPITTS. Pp. x + 245. 7s. 6d. net. 1918. (Chapman & Hall.)

A book for beginners in the use mainly of Cartesian Coordinates. The conspicuous topics are the "equations of loci" and the "loci of equations," and the subject-matter is not confined to algebraic equations of the first and second degrees. The equation of a straight line in the gradient form

$$y - y_1 = m(x - x_1)$$

very properly takes the first and prominent place. The book is overloaded with explanations, instructions and warnings, suggesting that the reader is not expected to do much thinking for himself, and the geometry is somewhat thin. There are chapters dealing with the simplest forms of the equations of the circle, parabola, ellipse, hyperbola; a short chapter on tangents and normals, another on poles and polars introduced by means of the harmonic property, and a very short discussion of the general equation of the second degree. Then follows a chapter on transcendental and parametric equations, and finally a chapter on solid analytic geometry dealing with the plane and straight line, and the forms of surfaces given by the simplest equations of the second degree. The opportunity is not taken to introduce the useful topics associated with "plan" and "elevation," and the polar coordinates of P are defined as OP and its direction-angles with OX , OY , OZ . The book is well illustrated by frequent diagrams, and there is an abundance of easy exercises for the student.

The Analytical Geometry of the Straight-Line and the Circle. By J. MILNE. Pp. xii + 243. 5s. 1919. (Bell & Sons.)

The author confines his attention to Rectangular Cartesian Coordinates, and with these limitations gives a very full treatment of the straight-line and the circle. He is careful to avoid "mere pieces of algebraic work," and maintains throughout a geometrical atmosphere. The diagrams and exercises are very numerous, and the latter are well chosen, many being worked out in detail. In Chapter V. the "polar coordinates" of a point on the circle $x^2 + y^2 = a^2$ are defined as $a \cos \theta$, $a \sin \theta$. The linear expression $lx + my$ is interpreted as twice the area of the quadrilateral (o, o) , (m, o) , (x, y) , (o, l) , the figure being drawn with l , m , x , y all positive. Hence the equation $lx + my + n = 0$ represents a straight line parallel to the join of (m, o) and (o, l) . Later the notion of *gradient* is introduced leading to the equation of a line in the form $y = mx + b$. The form $y - y_1 = m(x - x_1)$ comes in Chap. VIII., and this postponement of the fundamental idea is largely responsible for the unnecessarily slow acquisition of power. There are a few obvious misprints, such as can scarcely be avoided in the first edition of a book of this size,—also a few instances of confusion between theorem and converse. For instance, on page 218 the theorem is enunciated, "Two circles cut orthogonally if the square on the line joining their centres is equal to the sum of the squares on their radii." In the proof which follows, the hypothesis is that the circles cut orthogonally, and the conclusion is that " $C_1 C_2^2 = r_1^2 + r_2^2$," as was to be proved."