University of the State of New York

Examination Department

134TH EXAMINATION

PLANE TRIGONOMETRY

Thursday, January 30, 1896—9:15 a. m. to 12:15 p. m., only

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100 *credits, necessary to pass,* 75

Answer 10 questions but **no more.** *If more than 10 questions are answered only the first 10 of these answers will be considered. Division of groups is not allowed. Let A, B and C represent the angles of a triangle, a, b and c the opposite sides and S the area. In a right triangle C represents the right angle and c the hypotenuse. Each complete answer will receive 10 credits.*

1 Define *angle, oblique triangle, logarithmic sine, complement of an angle, supplement of an angle.*

2 Give the limiting values of the sine, tangent and cosine of an angle. Explain how each is determined.

3–4 Arrange in a tabular form the values of the sine, tangent and secant of *each* of the following angles: $0°$, $90°$, $180°$, $270°$, $360°$. Prefix the proper signs to the values.

5–6 Determine the value of tan $(A+B)$, and of tan $(A-B)$ in terms of functions of A and B.

7 Derive the equivalent expressions for sin 2 A and cos 2 A.

8–9 In a right triangle given cos $A=\frac{7}{10}$ and $c=40$; find the values of cos B, ctn B, a, b, and S.

10 Prove that in any plane triangle $a=b \cos C+c \cos B$.

11 Express in terms of the product of two functions of A the value of *each* of the following: sin A, tan A, sec A.

12–13 In an oblique triangle given a, b and C; derive the formulas for finding A, B and c. Show how each formula is obtained.

14–15 Show what measurements must be made and what formulas are necessary to find the hight of an inaccessible tower standing on the same plain as the observer.