University of the State of New York
Examinations Department
79th examination
PLANE TRIGONOMETRY

Thursday, Jan. 28, 1892—9:15 a.m. to 12:15 p.m., only

48 credits, necessary to pass, 36

Note.—Draw carefully and neatly each figure, using letters instead of numerals. Arrange work logically.

1. Define and illustrate (a) negative angle; (b) angle of depression; (c) system of logarithms.

2. Mention (a) each function of the angle of a triangle which determines whether the angle be greater or less than 90°; (b) each function which fails to do so.

3. Find \( \sin A, \tan A \) and \( \cos A \) when \( a \), the side opposite \( A \) in a right triangle, equals two-thirds of \( c \) the hypotenuse. Also find \( b \) if \( \cot A = 3 \) and \( a = 12 \).

4. Find (a) the complement of \(-40°\); (b) \( \tan (-20°) \) in terms of \( +20° \); (c) \( \cos A \) and \( \tan A \) in terms of \( \sin A \).

5. Find the value of the trigonometric functions of 60°.

6. Show that (a) \( \cos (270° - A) = -\sin A \).
   
   (b) \( \sin (180° - A) = + \sin A \).

7. If \( A, B \) and \( C \) represent the angles of an oblique triangle and \( a, b \) and \( c \) their opposite sides respectively, prove that

   (a) \( a = b \cos C + c \cos B \).

   (b) \( b^2 = a^2 + c^2 - 2ac \cos B \).

8. In a parallelogram, given \( d \) a diagonal, and \( A \) and \( B \) the angles which this diagonal makes with the sides; find, in terms of \( d, A \) and \( B \), the sides \( a \) and \( b \), and the area \( S \) of the parallelogram.

9. Let \( A \) represent the angle of elevation of \( C \), the top of an inaccessible hill observed from a point \( M \) on a plain, \( a \) the distance from \( M \) to \( N \) on a line \( MN \) perpendicular to \( MC \), and \( B \) the angle \( MNC \). Find \( h \) the height of the hill and \( d \) the distance from \( M \) to a point directly under \( C \).