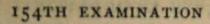
University of the State of New York

Examination Department



PLANE TRIGONOMETRY

Thursday, June 16, 1898 - 9:15 a. m. to 12:15 p. m., only

100 credits, necessary to pass, 75

Answer 10 questions but no more. If more than 10 are answered only the first 10 answers will be considered. Division of groups is not allowed. A, B and C represent the angles of a triangle, a, b and c the opposite sides, 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 cosecant, logarithm, quadrant, supplement of an angle, oblique triangle.
- 2 Show in tabular form the signs of six trigonometric functions in each of the four quadrants.
- 3 Express as a function of an angle less than 45° each of the following: sin 185°, tan 267°, sec 345°, cos 87°, cot -19°.
 - 4 Prove that $\cot A = \operatorname{cosec} A \cos A$; $\tan^2 A = \sec^2 A 1$.
- 5 Construct a right triangle one of whose legs is 3 and the sine of the adjacent acute angle 2.
 - 6 Prove that $\sin (x+y) = \sin x \cos y + \cos x \sin y$.
- 7 Express in terms of functions of A each of the following: sin 2A, cos 2A (three different forms), tan 2A.
 - 8 If $\tan A = \frac{3}{4}$ find the other functions of A, noting the signs.
- 9 Derive a formula used in finding the area of a right triangle.
- 10 Given $\log 2 = .3010$, $\log 3 = .4771$; find $\log \frac{1}{24}$, $\log .25$, $\log 16.2$, $\log \sqrt{\frac{8}{9}}$, $\log \sin 30^{\circ}$.
- Given two sides and an included angle of a triangle; derive the formula for finding the third side.
- 12 Given the three sides of a triangle; derive the formula for finding the angles.
 - 13 Prove that sin 105° + cos 105° = cos 45°.
- 14-15 What measurements must be made by an observer on the shore to find the distance between two buoys? Give formulas necessary for solving.