University of the State of New York

75TH EXAMINATION

PLANE TRIGONOMETRY

THURSDAY, Jan. 22, 1891—9:15 A. M. to 12:15 P. M., only

40 *credits, necessary to pass,* 30

In each of the following let A represent an acute angle.

1. Define and illustrate (*a*) sine A, (*b*) tangent A, (*c*) secant A. 3

2. If $\tan A = \frac{5}{12}$, find $\cos A$ and $\csc A$ and their reciprocals. 3

3. Prove that (*a*) $\cos^2 A = \dfrac{1}{1+\tan^2 A}$ 1

(*b*) $\cos^2 A \tan^2 A + \sin^2 A \operatorname{ctn}^2 A = 1$. 2

4. Prove that (*a*) $\sin (90° + A) = \cos A$. 2

(*b*) $\cos (90° + A) = -\sin A$. 2

5. Find $\cos A$ and A when $\tan \frac{1}{2} A = 1$. 3

6. Construct the tan, ctn and cos of an arc in the third quadrant; give the sign of each and state your reason. 6

7. What is the characteristic of a logarithm ; upon what does it depend ; when is it positive, when negative ? 4

8. Given $\log 3 = 0.47712$, find (*a*) $\log .003$, (*b*) $\log 81$. 2

9. In a triangle right angled at C, having given A and b find the formulas for computing a, c and the area in terms of A and b. 3

10. In an oblique triangle, given a, b and C, find the formulas for computing A, B and c. 3

11. If A represent the angle of elevation of the top of an inaccessible hill from a certain point on a plain and B the angle of elevation from a point of the plain a feet nearer the hill, find the formulas for computing h, the height of the hill. 6