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University of the State of New York

Examination Department
127th examination
PLANE TRIGONOMETRY

Thursday, January 24, 1895 — 9 : 15 a. m. to 12 : 15 p. m., only

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100 *credits, necessary to pass,* 75

Answer questions 1-5 and five of the others but no more. *If more than five of these other questions are answered only the first five of these answers will be considered. Division of groups is not allowed. In questions 3, 4-5, 11-12, 14-15, 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 *quadrant, angle of the second quadrant, cosine, logarithmic cotangent, solution of a triangle.*

2 Construct the negative functions of an arc in the fourth quadrant and designate each function by name.

3 Construct a right triangle having $a=3$ and $\cos A=\frac{2}{3}$.

4–5 In a right triangle $a=36$ and $\cos B=.52$; find b, c, $\tan A$, $\cos A$ and S.

6 Given $\csc A=-\frac{5}{3}$; find the values and signs of the other functions of A.

7 Find *six* trigonometric functions of $30°$.

8 Prove that $\cos (A-B)=\cos A \cos B+\sin A \sin B$.

9 Prove that sine and tangent of $-A$ equal respectively sine and tangent of $+A$ except in sign.

10 Prove that $\cos A \sec A=1$; $\csc^2 A=\operatorname{ctn}^2 A+1$.

11–12 In any plane triangle prove that $a+b : a-b=\tan \frac{1}{2}(A+B) : \tan \frac{1}{2}(A-B)$.

13 Given $\log \tan 39°=9.908$ and $\log \cos 39°=9.891$; find $\log \sin 39°$, $\log \sec 39°$ and $\log \operatorname{ctn} 39°$.

14–15 In an oblique triangle $a=600$ feet, $B=30°$ and $C=120°$; find the numeric values of A, b and c.