University of the State of New York.

37TH ACADEMIC EXAMINATION.

PLANE TRIGONOMETRY.

THURSDAY, March 6, 1890—Time, 9:30 A. M. to 12:30 P. M., only.

36 credits, necessary to pass, 27.

1. Define trigonometry: complementary angles; mantissa and characteristic of a logarithm. What is the significance of a negative characteristic? 5

2. Illustrate geometrically the following functions of arcs; sin 90°; cos 180°; tan and cosec 45°; and clearly indicate each.... 4

3 The log. of 2 is .30103, and the log. of 3 is .47713. Find the log. of 144 3

4. Given the cos$=\frac{1}{3}$. Find values of sin, tan, and cot 3

5. Prove that sin $(a+b)$ = sin a cos b + cos a sin b 4

6. By means of fundamental formulas prove that:

(a) $$\cot x + \tan y = \frac{\cos(x-y)}{\sin x \cos y}$$ 2

(b) $$\tan(a+b) = \frac{\tan a + \tan b}{1 - \tan a \tan b}$$ 2

7. Prove that in any plane triangle the sines of the angles are proportional to the opposite sides..... 2

8. How can the perpendicular from one angle to the opposite side be found, in any plane triangle?..... 2

9. In an oblique triangle, A B C, given a, b, and angle C, state formulas for finding the remaining parts and the area of the triangle..... 4

10. The diameter of the earth being taken as 7912 miles, what is the distance of the remotest point of the surface visible from the summit of a mountain 1¼ miles in height? Draw figure and explain as fully as possible with formulas, how the problem should be solved..... 5