Examinations Department

108th examination

PLANE TRIGONOMETRY

Thursday, March 16, 1893—9 : 15 a. m. to 12 : 15 p. m., only

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100 *credits, necessary to pass,* 75

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

1 Define and illustrate *cosecant, negative angle, tabular logarithmic tangent, vertical angle.* 16

2 Prove that sin A is (a) not greater than 1; (b) less than tan A; (c) equal to cos A tan A. 12

3 Construct the positive functions of an arc (a) in the third quadrant; (b) in the fourth quadrant. Designate each positive function by its name. 10

4 Find the numeric value of (a) sin 60°, tan 60° and sec 60°; (b) sin 30°, tan 30° and sec 30°. 12

5 Reduce and simplify $\tan(90°+A)+\tan(-B)-\tan(180°-B)$. 8

6 Prove that $\tan(A-45°)=\dfrac{\tan A-1}{\tan A+1}$. 8

7 If $x=\dfrac{m}{n}$, prove (a) $\log(m+n)=\log n+\log(x+1)$; ($b$) $\log(m-n)=\log n+\log(x-1)$. 12

8 Given m and n, the parallel sides of a trapezoid; also M and N, the angles adjacent to m; in terms of these given parts, find (a) the other two angles of the trapezoid; (b) each non-parallel side; (c) the area of the trapezoid. 12

9 The distance between two trees can not be measured directly because of an intervening body of water. Show what measurements must be made and what formulas are necessary to compute this distance. 10