High School Department

180TH EXAMINATION

TRIGONOMETRY

Thursday, January 28, 1904—9.15 a. m. to 12.15 p. m., only

Answer eight questions but **no more.** *Include at least three from the third division if credit is desired for both plane and spheric trigonometry. If more than eight are answered only the first eight 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. In a right triangle C represents the right angle. Each complete answer will receive* 12½ *credits. Papers entitled to 75 or more credits will be accepted.*

Give special attention to arrangement of work.

First division

1 Define radian, negative angle, third quadrant, mantissa of a logarithm, angle of depression.

2 Find the number of degrees in A when $3 \sin A = 2 \cos^2 A$

3 Write with their algebraic signs the numeric values of *six* functions of an angle of 585°.

4 Complete and demonstrate the following: the cosine of the difference of two angles is equal to . . .

Second division

5 In a plane triangle $a=32$ feet, $b=40$ feet, $c=50$ feet; find A, B and C.

6–7 Given in a plane triangle $a=20.94$, $b=25.96$, $A=44° 11'$; find *two* possible values for each of B, c and C.

8 Show the application of trigonometry to finding the distance across an impassable stream. Give diagram and all formulas necessary to solve the case selected.

Third division

9 Prove that if the hypotenuse of a right spheric triangle is less than 90°, the legs are in the same quadrant, and that if the hypotenuse is greater than 90°, the legs are in different quadrants.

10 In a right spheric triangle $a=77° 22'$, $B=151° 10'$; find A, b and c.

11 In an oblique spheric triangle $A=172° 18'$, $B=8° 28'$, $C=4° 24'$; find a.

12 Find the hour of sunrise and of sunset today at Washington, D. C.; the latitude of Washington is 38° 53′ north and the sun's declination 15° 29′ 20″.