The University of the State of New York

215TH HIGH SCHOOL EXAMINATION

TRIGONOMETRY

Thursday, June 22, 1916—1.15 to 4.15 p. m., only

Write at top of first page of answer paper (*a*) name of school where you have studied, (*b*) number of weeks and recitations a week in trigonometry.

The minimum time requirement for plane trigonometry is two recitations a week for a school year; for plane and spheric trigonometry three recitations a week for a school year.

Students taking this examination may use textbooks and notes prepared previous to the examination, but there must be no communication among students after the examination has begun.

Candidates for plane trigonometry should answer five questions from group I.

Candidates for plane and spheric trigonometry should answer five questions, selecting three from group I and two from group II. To receive credit for plane and spheric trigonometry, a candidate must secure at least 24 credits from group II.

Group 1

1 Given $a=41.6$, $A=55^\circ\ 15'$, $B=72^\circ\ 30'$; find C and c. [20]

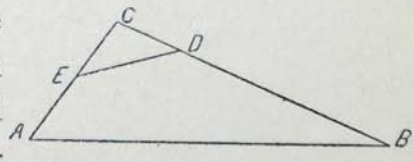
2 Given $a=21.3$, $b=17.5$, $c=15.2$; find the angles [16]. Check the result [4].

3 An observer in a balloon, which is directly above a fort at an altitude of 6150 feet, notes that the angle of depression of a fort of the enemy is $11^\circ\ 21'$; what is the distance between the forts? [20]

4 Solve the equation $2\cos x+3\sec x=7$ for all values of x between 0° and 360° [16]. Check the result [4].

5 Prove the identity $\dfrac{1+\sin 2x}{1-\sin 2x}=\left(\dfrac{\tan x+1}{\tan x-1}\right)^2$ [20]

6 A surveyor, desiring to find the area of a triangular lot ABC on which AB can not be measured directly, takes the following measurements: $CD=25'$, $CE=25'$, $ED=37.12'$, $CA=52.15'$, $CB=105.24'$



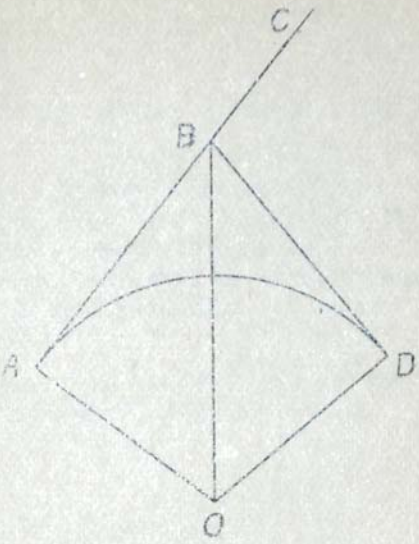
a Find the angle C. [10]

b Find the area of the lot. [10]

7 *a* Given the circle whose center is at *O*; *AB* and *BD* are tangents, *AB* is produced to *C*.

$\angle DBC = 105° 30'$, $AB = 34.2$ feet.

Find the length of the radius *AO*. [10]



b By the use of logarithms find the value of

$$\frac{.32 \times \sqrt[5]{65.4}}{(.042)^2}$$ [10]

8 The diagonals of a parallelogram measure 42 feet and 36 feet respectively and they intersect at an angle of 42° 15′; find the length of the shorter side of the parallelogram. [20]

Group II

9 In a right spheric triangle, given $a = 75° 20'$, $b = 36° 50'$; solve the triangle. [20]

10 In an oblique spheric triangle, given $A = 32° 45' 15''$, $B = 102° 15' 10''$, $c = 55° 4'$; find *C*. [20]