

The University of the State of New York

EXAMINATION FOR QUALIFYING CERTIFICATES

PLANE TRIGONOMETRY

Thursday, June 20, 1918 — 1.15 to 4.15 p. m., only

Answer six questions. Papers entitled to less than 75 credits will not be accepted.

1 Prove that in any circle the chord which subtends at the center an angle of 108° is equal to the sum of the two chords which subtend at the center angles of 36° and 60° respectively.

2 Given $\sin A = \frac{3}{5}$, find the value of $\cos A$; of $\tan A$; of $\cot A$; of $\sec A$; of $\csc A$.

3 Solve $\sin 4A - \sin 2A = \cos 3A$

4 Prove that $\sin 2x = \frac{2 \tan x}{1 + \tan^2 x}$

5 Without the use of tables, show that $\cos 20^\circ \cos 40^\circ \cos 80^\circ = .125$

6 Two sides of a parallelogram are 5 inches and 7 inches respectively and their included angle is 75° ; find the area of the parallelogram.

7 In the triangle ABC , $B = 50^\circ$, $C = 120^\circ 40'$, $BC = 148$ feet; find c and b .

8 In order to find the distance between two objects, A and B , a point C is selected and the distance CA is found to be 380 feet, CB to be 340 feet and angle C to be $61^\circ 35'$; find the distance AB .

9 The three sides of a triangle are 56 feet, 72 feet and 90 feet respectively; find the size of the largest angle.