*The University of the State of New York*

EXAMINATION FOR QUALIFYING CERTIFICATES

# PLANE TRIGONOMETRY

**Wednesday, September 12, 1917—9.15 a. m. to 12.15 p. m., only**

---

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

1 *a* Mention (1) each function of the angle of a triangle which determines whether the angle is acute or obtuse, (2) each function which does not so determine.

*b* When tan $A$ is $1\frac{5}{12}$ what is the value of all the functions of the supplement of $A$?

2 Find the radius of a circle if an arc 5″ long subtends at the center an angle of 22° 15′.

3 Solve for values of $x$ less than 360°

$$\sin 2x - \cos x = \cos^2 x$$

4 A schoolroom is 30′ long, 24′ wide and $13\frac{1}{2}$′ high; a rope is stretched from one corner of the floor diagonally across the space of the room to the opposite corner of the ceiling. Find the angle of inclination which the rope makes with the floor.

5 Prove $\cot(x+y)+\cot(x-y)=\dfrac{\sin 2x}{\sin^2 x-\sin^2 y}$

6 The sides of a triangle are respectively 34.72, 31.46 and 28.11; find the smallest angle of the triangle.

7 $a=46.792$, $c=61.234$, $B=45°\ 29'\ 16''$. Find $A$ and $b$.