TRIGONOMETRY—concluded

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° 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.

Group III

10. Without using Napier's law, prove that in a spheric triangle \( \cos B = \tan a \cot c \)

11. In a right spheric triangle, \(a = 86° 40'\) and \(A = 88° 11'\); solve the triangle completely.

12. In an oblique spheric triangle, \(a = 95°, b = 58°, c = 42°\); find the size of angle \(A\).

13. Assuming the radius of the earth to be 4000 miles, find the number of miles on a great circle from a point on the equator in longitude 50° W. to a point on the prime meridian in latitude 38° N.

Group I

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 \( \sin A = \frac{1}{2} \), 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 \( \cos 20° \cos 40° \cos 80° = .125 \)

Group II

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 \(ABC\), \(B = 50°, C = 120° 40', BC = 148\) feet; find \(a\) and \(b\).