

tain, supposing a cubic inch of copper to weigh $5\frac{1}{4}$ oz., and a cubic inch of tin $4\frac{1}{4}$ oz.

7. Find the sum of n quantities in A. P. by a general formula.
8. The sides of a triangle are in G. P.; the ratio of the first to the second is $3\frac{1}{3} : 4\frac{1}{6}$, and the perimeter is 490 feet : Find the sides.
9. Define the *base* of a system of logarithms ; the *logarithm* of a number.
10. State and prove the rule for raising a number to any power by logarithms. What advantage have common logarithms over the logarithms to any other base but 10?

SENIOR MATHEMATICS.

1. Trace the signs of the Sine and Cosine throughout the circle, and give the appropriate signs to the Sine and Cosine of $[(2n+1)\pi + A]$, supposing A less than $\frac{\pi}{2}$.
2. Find the Sine and Cosine of $2A$; and the Sines of 15° and 18° .
3. Find the sine of nA .
4. $\cos A + \cos B = 2 \cos \frac{1}{2}(A+B) \cos \frac{1}{2}(A-B)$.
5. $\operatorname{Cosec} 2A + \cot 2A = \cot A$.
6. In order to ascertain the height of a mountain, a base was measured of 2761 feet, and at either extremity of this base were taken the angles formed by the summit and the other extremity. These were $58^\circ 29'$ and $111^\circ 52'$; also at the extremity where this latter angle was taken the angular height of the mountain was $11^\circ 18'$: Required the mountain's height. Log. $58^\circ 29'$, 9.93069. Log. $170^\circ 21'$, 9.22435. Log. $11^\circ 18'$, 9.29214. Log. 2761, 3.54107. Log. 2751, 3.43955.
7. The angles at the base of an isosceles spherical triangle are equal.
8. The sum of any two angles of a spherical triangle is greater than the third angle by a quantity less than π .