University of the State of New York

Examinations Department

108th examination

ADVANCED ARITHMETIC

Monday, March 13, 1893—9 : 15 a. m. to 12 : 15 p. m., only

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100 *credits, necessary to pass,* 75

NOTE—Give each step of solution, indicating the operations by appropriate signs. Use cancelation when possible. Reduce fractions to lowest terms. Express final result in its simplest form and mark it *Ans.*

1 Indicate the following operations by signs in one connected expression : the sum of the square roots of 3 and 5 multiplied by 7 ; this product increased by 4 times the square of the sum of 4 and 6 ; the 4th power of the entire sum. 8

2 Find the sum of $\frac{1}{2}$ and $\frac{2}{3}$ and illustrate by means of lines each step of the operation. 14

3 Demonstrate the common rule for multiplying a fraction by a fraction. 16

4 Compare the bank discount of any given sum with the true discount (days of grace not included in either case) and deduce a method of finding either from the other. 14

5 The diameter of the base of a cone is double that of the base of a cylinder of the same volume ; find the ratio of their altitudes. 10

6 Find the square root of 104976 and give a reason for each step in the process. 14

7 Deduce a rule for finding the sum of an arithmetic series and illustrate its use by finding the sum of 10 terms of the series whose first term is 2 and whose common difference is 4. 12

8 State a method of finding (*a*) the 6th root of any number ; (*b*) the 5th root of an integral number known to be a perfect 5th power. 12