University of the State of New York
High School Department
174TH EXAMINATION
ADVANCED ARITHMETIC
Monday, June 16, 1902 — 9.15 a. m. to 12. 15 p. m., only

Answer eight questions but **no more.** *If more than eight are answered only the first eight answers will be considered. Give each step of solution. Express final result in its simplest form and mark it Ans. Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted.*

1 Express in words *each* of the following: 600.035, .635, $600\tfrac{30}{5000}$, $\tfrac{630}{5000}$, $\tfrac{635}{1000}$

2 Prove by a general method that a common divisor of two numbers is a divisor of their sum, of their difference and of their product.

3 If I sell $\tfrac{2}{3}$ of a farm for what $\tfrac{4}{5}$ of the farm cost, what is my per cent of gain? Give analysis in full.

4 State how to determine (*a*) what common fractions give pure circulating decimals, (*b*) what common fractions give mixed circulating decimals, (*c*) the limit of the number of places in the repetend. Demonstrate each principle.

5 A man sold 700 shares of railway stock at $84\tfrac{1}{8}$ and invested the proceeds in $4\tfrac{1}{2}\%$ bank stock at $119\tfrac{7}{8}$, brokerage in each case $\tfrac{1}{8}\%$; find the annual income from the second investment.

6 In extracting cube root state and explain the process of (*a*) separating into periods, (*b*) forming the trial divisor, (*c*) completing the divisor.

7 Mention the French unit of (*a*) length, (*b*) area, (*c*) volume, (*d*) capacity, (*e*) weight. Show how the unit of length was originally determined and how each of the other units is related to it.

8 Find the cost, @ 12¢ a square yard, of painting the convex surface of a conical turret whose diameter is 8 feet and whose vertical hight is 7.5 feet.

9 A New York merchant remitted to London through his broker £12,000 18s 9d; find the cost of the draft if exchange is at $4.89\tfrac{1}{4}$ and brokerage is $\tfrac{1}{4}\%$.

10 An agent buys machines at 10% and 20% off the list price and sells them at 10% and 5% off the list price; find his per cent of gain.

11 A body on the surface of the earth weighs 27 pounds; assuming that the radius of the earth is 4000 miles, find the weight of the same body 2000 miles above the surface. [The weight of a body above the surface of the earth varies inversely as the square of the distance from the center of the earth.]

12 A man pays a debt in monthly payments in such a way that each payment is $2\tfrac{1}{2}$ times the preceding payment; his first payment is $5.12 and his last payment is $1250. Find the amount of the debt and the number of months it takes the man to pay it.