University of the State of New York

High School Department

180TH EXAMINATION

ADVANCED ARITHMETIC

Monday, January 25, 1904 — 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 all operations (except mental ones) necessary to find results Reduce each result to 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 Explain the relation between longitude and time. Distinguish between standard time and local time. What is the difference in time between eastern standard time and Pacific standard time?

2 Show that a^2-b^2 is divisible by 4, when a and b are positive integers and both are odd or both even.

3 A sum of money put at simple interest for 3 years at 4%, amounts to $672; in how many years will the same sum at the same rate amount to $1206? Write the proportion and solve by proportion.

4 It takes a man 9 hours to drive a certain distance at the rate of 7 miles an hour and to walk back at the rate of $3\frac{1}{3}$ miles an hour; what is the distance?

5 Prove that the product of the greatest common divisor and the least common multiple of two numbers is equal to the product of the numbers.

6 A man bought goods at discounts of 20 and 30 from the list price and sold at discounts of 10 and 4 from the list price; he failed to collect 10% of his sales. Find his per cent of gain.

7 A man sold 5% stock at $84\frac{1}{8}$ and invested the proceeds of the sale in 6% stock at $97\frac{7}{8}$, brokerage in each case $\frac{1}{8}$%; his income was thus increased $3. Find the amount of stock sold.

8 Two bodies weighing respectively 18 pounds and 24 pounds are attracting a third body; the first body is 40 feet distant from the body attracted, the second body 60 feet. Find the ratio of the attractions exerted by these two bodies. [The force of attraction varies directly as the weight of matter exerting it and inversely as the square of the distance through which it acts.]

9 Extract the cube root of 6,542,350.714927

10 The altitude of the frustum of a square pyramid is 11 feet; the sides of its square bases are respectively 24 feet and 18 feet. Find the number of cubic feet in the frustum.

11 A gives his note to B for $980 due in 6 months, money being worth 6%; B has the note discounted at a bank on the day the note is given. How much more would B have received had A paid the present worth of the debt?

12 A New York merchant buys 2000 meters of silk @ 7.2 francs a meter, paying a duty of 50% ad valorem; find in United States money the total cost to the merchant of a yard of the silk. [1 dollar=5.19 francs.]