The University of the State of New York

214TH HIGH SCHOOL EXAMINATION

ADVANCED ARITHMETIC

Tuesday, January 18, 1916—9.15 a. m. to 12.15 p. m., only

Write at top of first page of answer paper (*a*) name of school where you have studied, (*b*) number of weeks and recitations a week in advanced arithmetic. The minimum time requirement is two recitations a week for a school year or four recitations a week for half a school year.

Answer eight questions.

1 A note for $1435, dated July 7, 1913, and bearing interest at 5%, has the following payments indorsed on it: Aug. 11, 1914, $55; Nov. 26, 1914, $500; May 19, 1915, $100. Find the amount due today.

2 In a certain calculation the formula

$$E = a + \frac{bx}{1 - \frac{c^2}{x^2}}$$ is used.

Find, to *three* places of decimals, the value of E when $a = 4.574$, $b = 0.634$, $c = 2.781$, $x = 3.415$

3 When the correct time was 7 p. m. a man's watch indicated 6.53 p. m.; when it was 9 p. m. the watch indicated 8.57 p. m. How much must the watch be changed so that it will be correct at 8.45 the next morning?

4 The weight of a clock falls $3\frac{1}{2}$ feet in a week; through what angle does the minute hand turn while the weight falls $\frac{1}{10}$ of an inch?

5 Two rods, each 1 foot long, are divided, one into 9 equal parts, the other into 10 equal parts; if they are placed side by side, ends coinciding, how far must one rod be moved so that their seventh points of division will coincide?

6 A piece of elastic whose cross section is circular, with a diameter of $\frac{1}{10}$ of an inch, is stretched uniformly to twice its length; what is now the diameter of its cross section?

7 A railroad rail is 30 feet long; in how many seconds will the number of rails passed over equal the number of miles per hour that a train travels?

8 Wire .02 of an inch in diameter is being wound on a spool $\frac{3}{4}$ of an inch in diameter and $5\frac{1}{2}$ inches long, revolving at the rate of 25 revolutions per second; find the number of seconds that will be required to wind on the first layer of wire and also the length of the wire in this layer.

9 A gallon measure is in the form of a cylinder; its internal diameter may not differ by more than 5% from its depth. If it contains 231 cu. in., find its greatest and its least diameter to the nearest hundredth of an inch.