Tuesday, January 26, 1909 — 9:15 A. M. to 11:15 P. M., only

Answer eight questions, selecting two from each group.

Group I
1. Show, without dividing, whether or not 96,433 is divisible by 8, 9, 11, 13.
2. Find the value of
   \[ a \cdot \frac{72.2 + 10 - 2}{2} \cdot (0.5 + 1.60) + 2.125 + (1.75 - 0.5) \]
   \[ b \cdot \left( \frac{1}{3} \times 1\frac{1}{2} \times \frac{8}{11} \right) + \left( \frac{3}{4} \times \frac{1}{2} \times \frac{5}{4} \right) \]
3. From \( 2\frac{1}{2} \) subtract \( 1\frac{1}{2} \) and give a full explanation of each step in the process.

Group II
4. Explain in detail the 6's method of computing interest. Is interest computed by the 6's method greater or less than exact interest? Explain why.
5. If New York and New Haven R. R. sells at 180\(\frac{1}{4} \) and pays 7\(\frac{1}{2} \), and West Shore sells at 108\(\frac{1}{4} \) and pays 4\(\frac{1}{2} \), which is the better investment?

6. Water is 770 times as heavy as air and iron is 7.68 times as heavy as water; how many cubic meters of air will it take to weigh as much as 1 cubic decimeter of iron?

Group III
7. Explain the relation between longitude and time. When it is noon at Greenwich what is the longitude of that place at which it is (a) 6 p. m., (b) 3 a. m., (c) 40 min. 12 sec. after 9 p. m.?
8. Derive the formulas for the last term and the sum of a terms of an arithmetical series, the first term and the common difference being given.
9. Solve the following by proportion: If $250 at 1\% simple interest for 1 year and 6 months produces $25.55 interest, how long will it take $240 to produce $15 interest at 6%?

Group IV
10. A cylindrical vessel 14 inches high holds 3 cubic feet of water; what is the diameter of its base?
11. The contents of a cubic wooden packing case is 48\(\frac{1}{2} \) cubic feet; how many board feet are there in the six sides of this case?
12. If a cubic foot of water weighs 61\(\frac{1}{2} \) lbs what is the pressure per square inch at the bottom of a standpipe 40 feet high?