ADVANCED ARITHMETIC

Tuesday, June 15, 1909 — 9.15 a. m. to 12.15 p. m., only

Answer eight questions, including at least two from each group. Each complete answer will receive six credits. No credits will be allowed unless all operations (except mental ones) necessary to find results are given.

Group I 1 Prove that the difference of the squares of any two consecutive odd numbers is a multiple of 8. [Illustration will not be accepted as proof.]

2 Find the sum of ⅓ and ½. Write a full explanation of the process.

3 If ⅔ of an article cost $1.40, what will ⅞ of it cost? Give complete written analysis.

4 A man agreed to work for a farmer a year and to receive as wages $390 and a cow; at the end of nine months he was discharged and given $195 and the cow. Find the value of the cow. Give written analysis.

Group II 5 At an election 350 votes were cast for two candidates; ⅔ of the votes for one candidate equaled ⅝ of the votes for the other. Find the number of votes each received.

6 Find the proceeds of a six months note for $900 with interest at 6%, dated March 15, 1909, discounted at a bank today at 5%.

7 What must a man ask for a house that cost him $2700 in order that he may reduce the asking price 2% and still gain 15% on the cost?

Group III 8 Find the price of a 5½% bond that shall be as good an investment as a 4½% bond at 107½.

9 The specific gravity of sea water is 1.025; a rectangular vessel 15 cm deep and 10 cm wide contains 4 Kg of sea water. Find the length of the vessel.

10 A cylindric cistern 10 feet in diameter is 8 feet deep; find the number of gallons of water it will contain.