FIRST CLASS TEACHERS.

ARITHMETIC.

J. A. McLellan, M.A., LL.D.

1. Extract the square root of ·000997199881 to six decimal places, and reduce to its simplest form

$$\frac{\sqrt{(3.43)}+\sqrt{(.02744)}}{\sqrt{(270)}-\sqrt{(.08)}}.$$

2. A cistern holding 1299 gallons is filled by 3 taps, A, B, C, in 30 minutes; A conveys 10 gallons more than B every $2\frac{1}{2}$ minutes, and C 8 gallons less than B in the same time: how much does each supply per minute?

3. At the English Mint 1869 sovereigns are coined from 40 lbs. Troy of standard gold, which is 22 carats fine, and at the French Mint 155 twenty-franc pieces are coined from 2.2072 lbs. (avoirdupois) of gold 90 per cent. fine. The value of the alloy being neglected, find the number of francs in a sovereign, correct to three places of decimals.

4. Two men form a partnership, A contributing $5500 and B $4500; it is agreed that each shall receive $7\frac{1}{2}$ per cent. of the profits for managing the business, and that the remainder shall be divided according to the stocks and times of investment; at the end of 10 months B puts in $2000 additional capital, but ceases to aid in the management, and agrees that A shall thenceforth receive 15 per cent. of the profits for managing the business; at the end of 12 months from the time of starting, the profits are found to be $4000: how much of this should each receive?

5. Log 2 = ·3010300, log 3 = ·4771213, find log of :0000025.
In how many years will $100 exceed $1000 at 8 per cent. per annum compound interest?

6. A grocer sells coffee at a cash price which is $33\frac{1}{3}$ per cent. above cost; he also sells on credit, giving 8 lbs. for what would buy 9 lbs. if paid in cash: how much per cent. above cost is his credit price?

7. Assuming 19 as the specific gravity of gold, and 2·6 as the s.g. of quartz, find the quantity of gold per oz. in a mixture whose s.g. is 7.

8. A dealer purchased on six months' credit, goods to the amount of $520; after keeping them three months he sold them on credit for $577.70, and allowing money to be worth 8 per cent., he found that he had made $16\frac{3}{4}$ per cent. on the transaction; on what term of credit did he sell the goods?

9. A broker sold a farm for $6000, charging a certain rate of commission, and invested the proceeds less his charges on both transactions in city property, receiving on the latter a commission of 4 per cent. on the price paid; his entire commission was $375: what rate did he charge on the sale of the farm?

10. (i) A field in the form of a sector of a circle has its radius 80 yards, and its angle 112° 30′: find its area and the length of its arc.

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