

respective formulæ of iron pyrites, copper pyrites, zinc blende, realgar, galena, and cinnabar? What are the products furnished by these several minerals when heated in presence of air?

6. Draw a comparison between sodium and potassium compounds in respect of their occurrence in nature, and in respect of the difference of properties manifested by corresponding potassium and sodium compounds. Give illustrations of double decompositions taking place between potassium and sodium salts.

7. On testing a certain liquid you find that it reddens blue litmus-paper. What conclusion can you draw from this?

Had the liquid burned reddened litmus-paper blue, what conclusion could you have drawn?

8. What chemical changes occur when an aqueous solution of potassium iodide is added to an aqueous solution of each of the following salts:—Mercuric chloride, lead nitrate, sodium sulphate, silver nitrate, and sodium sulphite?

9. You are given seven test tubes, and are told that in one there is pure water, and in the other six there are respectively aqueous solutions of silver nitrate, copper nitrate, zinc sulphate, calcium chloride, magnesium sulphate, and potassium nitrate. How could you determine which test tube contained the pure water, which the silver nitrate, which the copper nitrate, &c.?

SECOND-CLASS TEACHERS:

ARITHMETIC.

1. (a) Divide $84'332476$ by 12.734 .

(b) The circumference of a circle divided by 3.1415926 gives the diameter nearly; what multiplier of five decimal places may be used instead of this divisor?

2. Show how to find the G.C.M. and the L.C.M. of two or more fractional numbers.

The G.C.M. of two fractional numbers is $\frac{1}{180}$, and their L.C.M. is $34\frac{1}{2}$; one of the numbers is $2\frac{1}{3}$, find the other.

3. Sterling exchange is quoted in Toronto

at $109\frac{1}{2}$ for 60-day bills; what must be paid for a 60-day bill for £45 8s. 6d.?

4. The old wine gallon is 231 cubic inches; the cubic inch is .000016386 cubic metres, and the imperial gallon is $4'54102$ litres; how many imperial gallons are there in 157 wine gallons?

5. There are two clocks, one of which loses $3\frac{1}{2}$ minutes a day, and the other gains $3\frac{1}{2}$ minutes a day; the latter marks a time 25 minutes in advance of the former: when will both clocks mark the same time?

6. A person had stock of the Dominion Bank; he received a half-yearly dividend of $4\frac{1}{4}$ per cent., which he invested in the same stock at $113\frac{1}{2}$, and his entire stock was now \$16,600; how much stock had he at first?

7. If 5 men earn as much in a day as 8 women, and 2 women as much as 3 boys, and if 7 men, 12 women, and 20 boys earn \$205.50 in 6 days, what amount will be earned in 8 days by 6 men, 10 women, and 24 boys?

8. If 12 lbs. avoirdupois of American standard silver, which is 90 per cent. fine, be coined into 175 dollars; and if the value of the alloy be $37\frac{1}{2}$ per cent. of that of pure silver, find the value of one pound Troy of the alloy.

9. A merchant imported 700 yards of silk and marked it to gain, as he supposed, 25 per cent.; but having neglected to take into account a charge of \$125 for freight and duty, he made only $6\frac{2}{3}$ per cent. profit: find the invoice price of the silk.

10. (1) How many yards of painting are there in the walls of a room 20 ft. long, 14 ft. 6 in. wide, and 10 ft. 4 in. high, allowing for a fire-place 4 ft. by 4 ft. 4 in., and two windows each 6 ft. by 3 ft. 2 in?

(2) Find the number of cubic feet in a hollow cylinder, the external circumference of which is 5 ft. 6 in., the internal circumference 3 ft. 8 in., and the length 18 feet.

EUCLID.

1. (a) Define straight line, segment of a circle, rectilineal angle, trapezium, superficies.

(b) From the XVIII. and XXXII. propositions, Book I., deduce, respectively, the