

by quarter their difference, the product will be 1024. What are the numbers?

Ans. 96 and 32.

VII. If a cubic foot of water contain $10\frac{1}{2}$ gallons, what must be the capacity in gallons of a tank that will hold sufficient water to flood a rink to the depth of $\frac{3}{4}$ of an inch, the size of the rink being 150 feet by 50 feet?

Ans. 4804 $\frac{1}{4}$.

VIII. In the previous question, if water expands $\frac{1}{10}$ of its own volume in freezing, and if the ice were $\frac{3}{4}$ of an inch thick, what would be the number of gallons held by the tank?

Ans. 4367 $\frac{1}{4}$.

IX. By what must be the G. C. M. of 18, 162 and 648 be multiplied so the product may be L. C. M. of the same numbers?

Ans. 36.

X. A man owns a rectangular lot 120 feet broad. What must be its depth, so that he may have $\frac{1}{2}$ acre; and what will it cost to fence this lot at 10 cts. per yard.

Ans. 72 $\frac{3}{4}$ feet, and \$12.84.

XI. A florin is 2 shillings, and a sovereign \$4.85, what is the smallest sum of money in pounds that can be expressed by an integral number either as guineas, florins or dollars?

Ans. £420.

XII. A , B , C and D are 4 towns, the population of A is $\frac{3}{4}$ that of B , population of B is $\frac{1}{2}$ that of C , and the population of D is thrice that of B and C together. What fraction is the population of A of that of D ?

Ans. $\frac{1}{12}$.

XIII. The length of a room is $\frac{3}{4}$ of its breadth and double its height; if, at 15 cts. per square yard it costs \$7.20 to get the floor painted, what will it be worth at 10 cts. per square yard to paint the walls and ceiling?

Ans. \$16.

XIV. A can do $\frac{1}{3}$ of a piece of work in $2\frac{1}{2}$ days, and while A can do $\frac{1}{3}$ of it B can do $\frac{1}{4}$ of it, how long will it take them together to do the work?

Ans. 4 $\frac{1}{4}$ days.

XV. A , B and C can together do a job in 12 days; A alone could do it in 30 days, and while A does $\frac{1}{3}$ of it B does $\frac{1}{4}$ of it. Find what part of the work C can do while A is doing $\frac{1}{3}$ of it.

Ans. $\frac{1}{3}$.

XVI. A man bought 3 town lots; he sold the 1st for \$225, which was a loss of $\frac{1}{10}$ on cost; for the 2nd he paid \$200, and sold it so as to make $\frac{1}{10}$ of cost. Now, if he paid \$150 for the 3rd, find at what percentage advance on cost he must sell it so as to gain $\frac{1}{10}$ on his whole outlay.

Ans. 36 $\frac{3}{4}$ per cent.

XVII. Twenty per cent. of A 's money = 30 per cent. of B 's, and 40 per cent. of B 's = 50 per cent. of C 's. They have altogether \$1320. How much has each?

Ans. A \$600, B \$400, C \$320.

XVIII. A merchant throws 10 per cent. off his marked prices for cash, and 5 per cent. off if the account is paid within 3 months, otherwise marked prices are charged. How much must be paid on July 1st to settle the following account:—February 15th—Goods marked at \$85 were bought, and \$50 paid. March 12th—Goods marked at \$36 were bought, and \$15 paid. April 9th—Goods marked at \$54 were bought, and on July 1st goods marked at \$65.

Ans. \$158.57.

XIX. The rain which fell on a surface 6 inches square during a storm was collected in a vessel whose cross section was 3 inches by 4 inches, and this water when frozen formed a cake of ice in the bottom of the vessel $\frac{3}{4}$ of an inch thick. Given that water expands 10 per cent. of its own volume in freezing, find what depth of rainfall there was on the average.

Ans. $\frac{1}{4}$ inches.

XX. On January 1st, 1881, A gave a mortgage for \$1000, bearing interest at 7 per cent. per annum, payable in 2 years. What sum did he invest in the 5 per cent. stocks at 105, so that when he invested an equal sum at the beginning of the 2nd year, together with the 1st year's dividends, the proceeds of these stocks at the end of 1882 just paid the mortgage, stocks remaining at 105.

Ans. \$533.72.

XXI. What would be the answer to the previous problem if the last clause read as follows: During 2nd year stocks rose to 110?

Ans. \$510.52.