

## CORRECTION OF ERRORS.

Criticize and improve the following sentences :

1. He wasn't a man whom any one would have thought would have done such a thing.
2. I don't know as I will be able to finish it before dark.
3. Neither you nor no other boy can prove that it was ~~me~~ that ~~done~~ it.
4. He carried it all the way without hardly spilling a drop.
5. He asked leave to set up a mark like they used to shoot at.
6. After having done this, and not wishing to be known, he disappeared from the ground.
7. He told the night about his adventures on his return who was very much surprised, etc.
8. He looked kind of surprised when I told him that there was over twenty applications for it.
9. Locksley told Hubert he could have hit the prize just as easy as he did if he had tried.
10. In this paper I shall only attempt to deal with the first of these cases.

## Arithmetic.

## PAPER I.

Below we give arithmetic the first of which is a continuation of the treatment of boxes as found in our last issue.

1. Find to the nearest gallon the capacity of an open quadrate tank measuring 7' 6" by 6' 4" by 5' 8" externally ; the material of which the tank is made being  $1\frac{1}{4}$  inches in thickness.
2. The external dimensions of a rectangular chest are 2' 3", 1' 8", 1' 2 $\frac{1}{2}$ ", and the sides, lid and bottom are one inch thick. Of how many cubic inches of iron is it formed.
3. A box is without a lid ; if the external length is 3 ft., width 2 ft., depth 1 ft. 6 in., and the thickness of the material is 1 inch ; find the number of cubic inches of the material.
4. The weight of iron is found to be about 7.7 times as heavy as that of an equal volume of water. Find the weight of a rectangular box, without a lid, full of water, if the outer dimensions are 4, 5, 6 feet, respectively, and the iron is one inch in thickness.

## EXERCISE II.

1. A speculator bought D. & H.R.R. stock a 125, kept it a year, during which time a 5% dividend was paid, and then sold the stock at 128 $\frac{3}{4}$ . Find the per cent. of gain per annum on his investment.
2. The discount of a bill of goods at 25% and 10% off is \$71.50. Find the net cost of goods.
3. A commission merchant writes his principal that he has purchased 40,000 bushels of oats at 21 cents a bushel, that the money advanced to him amounts to \$7,850, and requests the principal to send him a draft to balance the account. If his commission be 3% for buying, what should be the amount of the draft ?
4. The discount on a note discounted at bank in New York for 1 month, 27 days, at 6% per annum was \$42.75. Find the proceeds.

5. If a locomotive driving-wheel, 4 ft. 7 in. in diameter, turns 4,032 times in running a certain distance, how many times must one 5 ft. 6 in. in diameter turn in running 7 $\frac{1}{2}$  times as far ?

6. If a farmer is to shingle a barn roof 56 ft. long and 22 $\frac{1}{2}$  ft. wide on each side, with shingles (4 in. wide) laid 5 in. to the weather, how many (bunches  $\frac{1}{2}$  M. each) must he buy ?

7. The exact interest on a certain principal for 33 days at 5% per annum is \$3.30. Find the principal.

## EXERCISE III.

1. A person buys a crock of butter weighing 18 lbs. which includes the weight of the crock which was  $\frac{1}{3}$  that of the butter. Find the value of the butter at 20 cts. per lb.
2. A grocer sells a customer a dollar's worth of sugar at 8 cts. per lb., but uses a pound weight  $1\frac{1}{2}$  oz. too light. By what amount is the customer cheated ?
3. A piece of cloth lacks 7 in. of containing sufficient to make 6 coats each containing 1 $\frac{3}{8}$  yds. 2 $\frac{1}{2}$  in., and 8 pairs of trousers each containing 1 $\frac{1}{4}$  yds. 6 $\frac{1}{2}$  in. Find the quantity of cloth in the piece.
4. The population of a town after increasing by  $\frac{1}{12}$  of itself each year for three years is 606 less than 5000. Find the increase the second year.

## EXERCISE IV.

1. How much water must be added to a cask of brandy containing 63 gals., worth \$4 50 per gal., in order to reduce the price per gal. by  $\frac{1}{12}$  ?
2. A dealer buys articles at the rate 12 for 10 cts., and sells them at the rate of 9 for 15 cts. What part of his outlay does he gain ?
3. A man has \$45 made up of equal sums represented by each of our Canadian silver coins. How many coins had he ?
4. If the regular passenger fare on a railway be 3 cts. per mile, but return tickets good for 30 days be sold at a reduction of  $\frac{1}{3}$  on the full fare, find the distance between two places if the return fare be \$2.75.

## Algebra.

## EXERCISE I.

Before you attempt to factor the sum or the difference of two cubes be sure you thoroughly understand the following theorems :

1.  $x^n - y^n$  is divisible by  $x - y$  always, and all the signs in the quotient are plus.
2.  $x^n - y^n$  is divisible by  $x + y$  when  $n$  is even and the signs in the quotient will be plus and minus alternately.
3.  $x^n + y^n$  is divisible by  $x + y$  when  $n$  is odd and the signs in the quotient will be plus and minus alternately.
4.  $x^n + y^n$  is divisible by  $x - y$  never.

From this you will see that  $x + y$  is a divisor of  $x^3 + y^3$  and that the quotient is  $x^2 - xy + y^2$ . Or that the factor of  $x^3 + y^3 = (x + y)(x^2 - xy + y^2)$