

H. S. PRIMARY ARITHMETIC.

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1. (a) Find the square root of .2 to the fourth decimal place.

As we always begin from the decimal point to point off into periods of two for the extraction of the square root, this is the same as $\sqrt{.20}$, which again is the same as $\sqrt{\frac{2}{10}}$ the $\sqrt{20}$ or .4472 . . .

(b) The quotient of 1 divided by $(3.14159)^2$ to fourth decimal place.

This should be done by the methods of contracted multiplication and division for decimals. Unfortunately these methods are not taught in the schools to the extent that their importance demands. An expert knowledge of these processes will not only frequently save a large amount of work, but will, in many cases, save also, the employment of logarithms in trigonometric solutions. The writer would undertake to "solve" for the side or angle of a triangle by natural fractions and contracted processes in less time and with greater accuracy than any person can do it by means of logarithmic tables.

The work of the question will stand as follows :—

314159
951413

942477
31416
12566
314
157
28

$$9.86953 = (3.14159)^2$$

$$9.86953(10000,0.1013$$

9870
130
99
31
30

quotient to 4 decimals.

2. (b) A number of two digits is multiplied by 3, and the product is placed to the left of the original number; show that the number so formed is always exactly divisible by 7.

To move any integer one place to the left, in a number, is to multiply that integer by 10; to move it through two places is to multiply by 10^2 or 100, etc.

Therefore, by multiplying our number by 3, and then moving the result two places to the left, is to multiply the original number by 300. And as this is placed to the left of the original number, the whole number is 301 times the original. But 301 is divisible by 7; and hence the whole number is divisible by 7.

3. TORONTO, Jan. 15th, 1894.

Ninety days after date, I promise to pay to A. Bee, or order, the sum of one thousand two hundred and thirty-four $\frac{1}{100}$ dollars, at the Bank of Commerce here. Value received.

C. DEE.

This note was discounted on Feb. 10th, 1894, at 6% per annum. Find the proceeds.

The proceeds will be different according as we take true discount or bank discount, although the bank will, of course, take bank discount. We solve for both.

The note is made for 90 days and is discounted after having run for 26 days. Hence it is discounted for 64 days.

For true discount. The interest on \$100 for 64 days at 6% per an. is $\frac{3}{100} \times 6$, or $\frac{18}{100}$ dollars, and the amount is $\$100 + \frac{18}{100} = \$101\frac{18}{100}$.

$\therefore$ Proceeds are \$100 taken as many times as $\$1.234\frac{1}{2}$ contains $\$101\frac{18}{100}$, or $\frac{1}{100} (1,234\frac{1}{2}) \div (101\frac{18}{100}) \times 100 = \$1,221\frac{1}{100}$ to the nearest cent.

For bank discount. Interest on $\$1,234\frac{1}{2}$ for 64 days at 6% per an. is $1234\frac{1}{2} \times \frac{1}{100} \times \frac{6}{100} = \12.99 to the