rest, or read it so that othern can understand the meaning. As to Mr. Knight's quotations, "Cain was with Adam and Cain was Adam, Jacob was with Israel and Jacob was Israel," I can only say that if my quotation was unfortunate, his are extremely absurd, for there is no similarity betw.on them and the "word was with God, and the word was God," for Cain and Adam were two distinct and separate beings, having separate natures, and not two in one as God and Son had. Jacob (for the same reason) could not possess two natures in one ; therefore, these comparisons to God and the Word, Christ, are simply ludicrous, and need no further refutation. Mr. Knight must be groping in darkness.

In reference to Mr. Knight's "lastly," I have only to say that it is not necessary for us to discuss "whether many of the best orators have known nothing of rules " but whether, according to rules well understood, John i. 1 should be read in this way or in that way.

Respectfully yours,

J. M. H. HARRISON.

Examination Questions.

Woodstock, June, 1880.

EDUCATION DEPARTMENT, ONTARIO.

JULY EXAMINATIONS, 1880.

SECOND CLASS TEACHERS AND INTERMEDIATE.

ARITHMETIC.

TIME-THREE HOURS:

Examiner-J. A. McLellan, LL.D.

Values-Each 10 marks.

1. The G. C. M. of two numbers is 9187, and their L. C. M. is 684938944494: one of the numbers is 68590142, find the other.

2. (1) Divide 159.982 by .0009840018 to 7 places of decimals.

(2) Reduce $\frac{61}{4649}$ to a periodic decimal.

(8) Reduce .7002457 to a vulgar fraction.

8. There is a rectangular garden whose length is to its breadth as 6 to 5; running round its outside is a gravelled path 8 yards wide; this path cost, at 183 cents per square yard, \$127.25. Find the dimensions of the garden.

 $\frac{2\sqrt{90}}{8\sqrt{103}} \times \frac{7\sqrt{192}}{5\sqrt{126}} - \frac{4\sqrt{15}}{15\sqrt{21}}$. Find the mean pro-4. Simplify

portional between 3402 and 15172; and extract the square root of .000097199881.

5. The oxygen of the air is 8 parts (by volume) in 14 of the whole; 100 cubic inches of air weigh 81 grains, and the weight of oxygen is to that of air as 53:48. Find the number of grains of oxygen in a cubic foot of air.

6. A, B, and C do a piece of work; it would have taken A 21 times as long as B and C together, and B 81 times as long as A and C together. If they receive \$240.40 for the work, how much should each man receive?

7. Assuming that 90 cubic inches of lead, together with 81 cubic inches of cork, are equal in weight to 2808 cubic inches of pine. and that the weights of equal bulks of lead and pine are represented by the numbers 226.48, and 9, respectively; determine the proportionate weight of an equal bulk of cork.

8. A merchant in Toronto owes £560 stg. in London, and remits as follows: first to Paris at 5 france 60 centimes per \$1; thence to Hamburg at 2 france per marc; thence to Amsterdam at 171 stivers per marc; thence to London at 224 stivers per £1. If the expense of this circuitous exchange be 2 per cent. (i.e., of \$102 paid by the merchant, \$2 is lost in commission), find what it costs to discharge the London debt,

9. I had two notes whose aggregate face value was \$761.70, and each of which had 15 months to run; one of the notes was discounted at 10 per cent. bank discount, and the other at 10 per cent. true discount, and the total amount realized was \$671.50. Find the face of the note on which true discount was allowed.

10. A cylindrical silver wire, .0015 millimetre in diameter, weighs 3.2875 grammes; it is to be covered with a layer of gold .0002 millimetro in thickness. Required the weight of the gold. the specific gravity of silver being 10.47, and that of gold 19.26.

$$(8) \ \frac{700245}{999999} = \frac{285}{407}.$$

 $\frac{127 \cdot 25}{\cdot 18\frac{3}{4}} = 678\frac{3}{3} \text{ no. sq. yds. in path.}$ 8.

 $\frac{6783-86}{2\times 9} = 107\frac{1}{5}$ no. yds. in two adjacent sides of path.

... sides = ${}_{1T}^{c}$ of 107 yds., and ${}_{1T}^{5}$ of 107 yds., or 58 yds., and 48 ${}_{5}^{c}$ yds.

4. (1)
$$4_{3}^{2}$$
. (2) 7184.8. (8) .009859.

5. No. grains = $\frac{3}{14} \times 1728 \times \frac{53}{48} \times \frac{31}{100} = 126\frac{261}{350}$.

A does work while A, B and C do $3\frac{1}{2}$ times work, \therefore A does $\frac{2}{7}$ of whole work, and ... gets ? of money = \$68.68 ?. B does work while A, B and C do $4\frac{1}{2}$ times work, $\therefore B$ does $\frac{2}{3}$ of whole work, and : gets $\frac{2}{3}$ of money = \$58.42 $\frac{2}{9}$. : C gets \$118.29 $\frac{13}{63}$.

7. Wt. =
$$\frac{2808 \times 9 - 22648 \times 90}{81} = 4.8$$
.

8. Cost =
$$\$560 \times 224 \times \frac{2}{85} \times 3 \times \frac{5}{28} \times \frac{102}{100} = \$2611.20.$$

- 9. 761.70-671.50=\$90.20 total discount. Bank discount on \$761.70=\$95.2125.
 - ... Dif.=\$5.0125=int. on true discount. 100

$$\therefore$$
 True disc. = $\frac{100}{1124} \times 5.0125 = 40.10

And note =
$$\frac{112\frac{1}{2}}{100} \times 40.10 =$$
\$860.90.

10. Wt. of gold

$$=\frac{(.00095)^{2}-(.00075)^{2}}{(.00075)^{2}}\times\frac{19.26}{10.47}\times9.2875 \text{ grammes.}$$

=3.655+grammes.

Values.

5

- 1. Find the value of $x^5 + x^4 166x^3 166x^2 + 81x + 81$ when x = -7; and the value of $x^3 - 8px^2 + (8p^2 + q)x - pq$ 5 when x = a + p. (Arrange the latter result according to powers of a.)
- 4 2. What is the cordition that x+b shall be a factor of $ax^2+bx+c?$

Find the factors of

(a). $(a^2-ab)+2(b^2-ab)+8(a^2-b^2)+4(a-b)^2$; and

- 8 (b). (ax+b)(bx+c)(cx+a)-(ax+c)(bx+a)(cx+b).
- C 8. What must be the relation among a, b, c that ax^2+bx+c may be a perfect square?

(a). Extract the square root of 5

- $(a-b^4-4(a^2+b^2)(a-b)^2+4(a^4+b^4)+8a^2b^2.$
- (b). If 5 be subtracted from the sum of the squares of any 8 four consecutive numbers, the remainder will be a perfect square, (Prove this.)