

6 *W* equals $dw + 20 \times 2$ lbs.

5 *W* equals $dw + 8 \times 2$ lbs.

∴ *W* equals 12x2lbs. equals 24 lbs.

(76.) There were at first 12 negroes to each white man equal to 24 negroes to every two white men. The addition of the 105 negroes raised this ratio to 29 negroes to every two white men; i.e. it raised the ratio by 5 negroes to every 2 white men, or 105 negroes were 5 negroes to every 2 white men.

105 negroes set off by fives give 21 fives; but for every five there were two white men; therefore, there were 21×2 white men equals 42 white men.

There were at first 12 times as many negroes or 404 negroes.

(The above is substantially the solution of the proposer, arranged for *graphic arithmetic*. On sending it he remarked, "I send also a problem on the same principle as one in the 'Second Class Paper' of last July" (1873) "which I understand, some think cannot be solved without algebra.")

(77.) The times of vibrations of pendulums vary as the squares of their lengths. Taking 315-56929" in a tropical year and 39.143 in. as the length of a second's pendulum at Cambridge the required length will be in miles

$$3155629002 \times 39.143 \div 63360$$

or rather more than 6152 millions of millions of miles.

PROBLEMS.

80. If the estimated annual value of the property in a certain parish consist of the yearly rent paid to the landlord together with the rates, and the rates be calculated upon the rent after a reduction of 30 per cent.; find the rateable value of a tithe-rent charge, the estimated annual value of which is £884 per annum, when the rates amount to 3s. in the pound.

D. McFARLANE, Arkell, from Barnard Smith's Arithmetic.

81. Problem 24, Exercise 56, page 217, Mc Murchy's Advanced Arithmetic.

WM. MILL, Sarnia.

82. Problem 19, Exercise 77, page 149, Elementary Arithmetic.

DO.

83. Problem 35, Exercise 56, Advanced Arithmetic.

E. H., Mosa.

ANSWERS TO QUESTIONS AT RECENT TEACHERS' EXAMINATIONS

Algebra—Second Class.

1. 1.

$$3x - 2y$$

2.

$$3x^2 - 5xy - y^2$$

3.

$$x = -\frac{1}{3}$$

4.

$$x = 3.$$

5.

$$x = \frac{5}{m}$$

6.

$$x = 3. \quad y = -1.$$

8.

$$\$4000.$$

9.

$$(b) \frac{1}{7}$$

10.

$$\text{Remainder in first case, } -1;$$

second, $\rightarrow 119$.

Natural Philosophy—Second Class

1. 40lbs.

4. 12 feet.

6. 29.52.

8. 10.

9. $m = 300$.

Arithmetic—Third Class.

- (1.) $3\frac{1}{2}$.
- (2.) 24003 oz., 2997 oz.
- (3.) \$3,000., \$24, \$14.40.
- (4.) \$16800.
- (5.) 16 $\frac{1}{2}$ ft.
- (6.) 22 $\frac{1}{2}$ dys.
- (7.) \$39,46125.
- (8.) \$60,000.
- (9.) \$108 loss.
- (10.) 58 $\frac{4}{7}$ per cent.

Arithmetic—Second Class.

86

1. _____

1251

2. 200.

3. \$100.

4. 83 $\frac{1}{3}$ cts.

5. Given.

6. \$400.

7. \$3570, \$3520.

8. \$26666.66 $\frac{2}{3}$.

6. \$16.92 $\frac{4}{13}$.

10. \$300.

11. £1666 13s 4d.

12. 10, 15, 20.

EDITOR'S DRAWER.

HIGH SCHOOL EXAMINATION. — We notice that the next examination for admission into the High Schools and Collegiate Institutes of Ontario, will be held on Tuesday and Wednesday, 8th and 9th December next.

LONDON COMMERCIAL COLLEGE.— We would call special attention to the advertisement of this excellent College, which will be found on second page of cover.