

6. Add the numerators together for the numerator and the denominators together for the denominator of a new fraction, which, since the given fractions are all equal to one another, must be equal to each of them.

$$\therefore \frac{10(x+y-z)}{10(x+1)} = \frac{x+y-z}{6}$$

$$\therefore x+1=6 \therefore x=5.$$

Substituting this value for x ,

$$\frac{10+3y-4}{10} = \frac{15+4y-2z}{25} = \frac{5+y-z}{6}$$

$$\therefore 7y-16z = -20,$$

$$\text{and } 4y-7z = -5,$$

$$\therefore y=4 \text{ and } z=3, \text{ and as found, } x=5.$$

ANS.

7. By Division

$$\frac{x}{y} = \frac{11x+4}{11y-8}$$

$$\therefore -8x=4y \therefore y=-2x.$$

Substitute for y in first of given equations

$$x^2+2x^2=11x-4$$

$$\therefore 3x^2-11x-4=0$$

$$\therefore (x-4)(3x+1)=0.$$

$$\therefore x=4 \text{ or } -\frac{1}{3}$$

$$\therefore y = -8 \text{ or } \frac{2}{3}$$

ANS.

8. Clear second equation of fractions

$$(z-x)y = b(y-x)z$$

Substitute for x its value as given by the first equation, and divide the resulting equation by $y-z$.

$$\therefore ay = bz \therefore y = \frac{bz}{a}$$

A.

Substitute bz for ay in first equation

$$\therefore x-z = ax-bz$$

$$\therefore x = \frac{1-b}{1-a}z$$

B.

Substitute for x and y in third equation their values given by A and B, and divide the result by z^2 ;

$$\therefore \left(\frac{1-b}{1-a}\right)^2 = \frac{b^2}{a^2}$$

ANS.

9. Let x equal A 's rate in miles per hour, and $y=B$'s rate in miles per hour.

From the time A first overtook B till he overtook him again was 5 hours, \therefore during those five hours B , who had gone steadily forward, had made 5y miles progress.

A was one hour later in arriving at his destination than he would have been had he kept steadily on, and the delay occurred during the five hours between the two overtakings; $\therefore A$ made only 4x miles progress while B was advancing his 5y miles. But they made equal progress during the 5 hours,

$$\therefore 5y=4x \therefore y=\frac{4}{5}x, \text{ i.e., } B\text{'s rate} = \frac{4}{5} \text{ of } A\text{'s rate.} - \text{ANS.}$$

NOTES.

Q. 1 was set about two years ago to candidates for junior matriculation in Toronto University, and an examiner might reasonably suppose that mathematical masters in our High Schools would have made a note of it quite irrespective of the fact that it is a particular case of a well-known elementary theorem. The problem is a practical test of an examinee's knowledge of the meaning of an exponent.

Q. 2 can be worked by multiplication and addition, or be made an exercise in factoring as is done above.

Q. 3 (a) and (b) are simple exercises in the theory of divisors and the principle of symmetry. The examinees are told that the factors are linear.

Q. 4 is an example of the form in which homogeneous simple equations present themselves in actual investigations.

Q. 5 is an example of the most important use in algebra of the process for finding the H. C. F. of two expressions, and the solution as given above exhibits how the process may sometimes be shortened.

Q. 6 affords an illustration of the widely useful theorem

$$\text{"If } \frac{a}{b} = \frac{c}{d} \text{ then will } \frac{a}{b} = \frac{ma+nc}{mb+nd}.$$

The theorem may be applied to resolve the equations in the way

exhibited above, or to show that each of the given fractions is equal to 1; for each of them

$$\frac{(x+y-z)(+4x+2y-3z)-(2x+3y-4z)}{6+(4x-1)-(x+5)} = \frac{3x}{3x} = 1.$$

This reduces the equations to the simplest type.

Q. 7 is an easy simultaneous quadratic pair.

Q. 8 is a very easy problem in elimination, one of the commonest operations in algebra.

Q. 9 is an ordinary problem. It was taken, with a slight change to render it easier to work, from an algebra paper set to boys and girls in England.

Educational Notes and News.

Georgetown is to have a High School.

There are said to be 1,300 members of the Chautauqua Literary and Scientific Circle in Japan.

Mr. J. H. Markle has received the appointment of Science Master in Paris High School.

The Galt School Board received application from no less than forty-five lady teachers at a recent meeting.

W. Nichol, an honor graduate of Queen's College, has been appointed science master in Guelph Collegiate Institute.

John Hopkins University has this year conferred the degree of Doctor of Philosophy on Dr. Shosuke Sato, a Japanese.

It is stated that Rev. Wm. Clarke, M.A., Professor of Mental and Moral Philosophy at Trinity College, Toronto, will resign at the coming Christmas.

Mr. E. Oldum, M.A., head master of Pembroke High School, has been appointed to take charge of the preparatory department of Tokio College, Japan, in the Spring.

At a recent meeting of the Board of Trustees of Woodstock Baptist College, Dr. Rand reported that \$26,000 had been subscribed towards the proposed \$39,000.

Seventy-six out of eighty candidates were plucked at the Windsor High School Examination, and at Simcoe only four passed out of seventy-five. Similar results are reported from many other localities.

A teacher needs three things for enjoyment in his profession—some leisure; a little surplus of money to be devoted to such ends; a true and liberal education, extending far beyond the range of school subjects.—*London School Journal*.

Mr. S. B. Sinclair, Ph. B., has been appointed assistant teacher in Hamilton Model School. Mr. Sinclair holds a first-class professional certificate, and is said to be well acquainted with the most modern Canadian and American educational methods.

Mr. J. W. Johnson, F.C.A., Principal of Ontario Business College, Belleville, has just returned from a visit to Bermuda in the interests of the college, which is largely patronized by Bermudians. Several students accompanied him to Belleville.

At the Division Court on Tuesday, the 18th of July, before his Honor Judge Woods, Mr. A. W. Aytoun Finlay, B.A., late head master of the Chatham High School, obtained judgment against the High School Board for the amount of his full claim with costs.

Official announcement has been made that the celebration of the 250th anniversary of Harvard University will take place in the first week in November. The plans are for a grand celebration, which is to last four days, in which as far as possible the whole of Harvard College, from the earliest years downwards, shall take part.

The Teachers' Drawing-Class at the Stratford Collegiate Institute, completed its session on 31st July. About 25 teachers, as well as other students, have availed themselves of this opportunity of studying the now important subject of drawing. At its close an address was presented to the Class Instructor, Mr. W. Burns, Drawing Master, Brampton High School, expressive of their satisfaction with the manner in which he had handled the subject, and of their wishes for his future success in his profession.

The meanest teacher on record—and that means a great deal to children—is the one at Liegnitz, in Germany, who gave her class the following problem for a holiday task:—From 880,788,899 deduct 629 until nothing remains. The poor girls figured and figured for hours without making much headway; finally their tears attracted the attention of the parents. A simple division will show