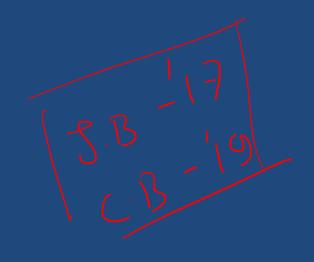
بِسْمِ اللهِ الرَّحْمٰنِ الرَّحِيْمِ বিস্মিল্লাহির রাহ্মানির রাহীম





একাডেমিক এন্ড এডমিশন কেয়ার

Q:13- $\frac{1}{1-x+x^2}$, $\frac{1}{1+x+x^2}$, $\frac{2x}{1+x^2+x^4}$ and $\frac{(x+1)^2-(x^2+x)}{x^3+1}$ four algebraic expressions here ... (A) Express The 1st and 2nd expressions in the form of common denominator -3, (A) Express The 1st and 2nd expressions in the form of common denominator -3, (A) Express The 1st and 2nd expressions in the form of common denominator -3, (A) Express The 1st and 2nd expressions in the form of common denominator -3, (A) Express The 1st and 2nd expression in the form of common denominator -3, (A) Express The 1st and 2nd expression in the form of common denominator -3, (A) Express The 1st and 2nd expression in the form of common denominator -3, (A) Express The 1st and 2nd expression in the form of common denominator -3, (A) Expression +2nd expr

(A) Here, the 1st expression =
$$\frac{1}{1-x+x^2}$$

and the 2nd expression = $\frac{1}{1+x+x^2}$
 \therefore L.C.M. of the denominator of the 1st and the 2nd denominator = $(1 + x + x^2)(1 - x + x^2)$
 $\therefore \frac{1}{1-x+x^2} = \frac{1+x+x^2}{(1-x+x^2)(1+x+x^2)} = \frac{1+x+x^2}{1+x^2+x^4}$

: The 1st and the 2nd expressions in the form of common denominator: $\frac{1+x+x^2}{1+x^2+x^4}, \frac{1-x+x^2}{1+x^2+x^4}$

B Here, the denominator of 3rd fraction =
$$1 + x^2 + x^4$$

= $1^2 + 2x^2 + (x^2)^2 - x^2$
= $(1 + x^2)^2 - x^2$
= $(1 + x^2 + x)(1 + x^2 - x)$
= $(1 + x + x^2)(1 - x + x^2)$
L.H.S. = 3rd expression+2nd expression-1st expression
= $\frac{2x}{1+x^2+x^4} + \frac{1}{1+x+x^2} - \frac{1}{1-x+x^2}$
= $\frac{2x}{(1+x+x^2)(1-x+x^2)} + \frac{1}{1+x+x^2} - \frac{1}{1-x+x^2}$
= $\frac{2x+1-x+x^2-1-x-x^2}{(1+x+x^2)(1-x+x^2)}$
= $\frac{2x-2x}{1+x^2+x^4} = \frac{0}{1+x^2+x^4} = 0 = \text{R.H.S.}$
So, 3rd expression+2nd expression-1st expression =0 (Showed)

Here,
$$2^{nd} expression = \frac{1}{1+x+x^2}$$

 $3^{rd} expression = \frac{2x}{(1+x^2+x^4)} = \frac{2x}{(1+x+x^2)(1-x+x^2)}$
 $4^{th} expression = \frac{(x+1)^2 - (x^2+x)}{x^3+1} = \frac{x^2 + 2x + 1 - x^2 - x}{(x+1)(x^2 - x+1)} = \frac{x+1}{(x+1)(x^2 - x+1)} = \frac{1}{x^2 - x+1}$
Here, $2^{nd} expression \div 3^{rd} expression \div 4$ th expression
 $= \frac{1}{1+x+x^2} \div \frac{2x}{(1+x+x^2)(1-x+x^2)} \div \frac{1}{x^2 - x+1}$
 $= \frac{1}{(1+x+x^2)} \times \frac{(1+x+x^2)(1-x+x^2)}{2x} \times \frac{(x^2 - x+1)}{1} = \frac{(1-x+x^2)^2}{2x}$

Q.5 | M = p² - pq + q², N = p² + pq + q², R = p⁴ + p²q² + q⁴ and S = p⁶ - q⁶
[Ctg. B.2019]
A. What is the lowest form of
$$\frac{a^{2}+4a-21}{a^{2}+5a-14}$$
? \rightarrow 5]
B. $\frac{1}{M} - \frac{1}{N} - \frac{2pq}{R} = ?$
C. $(\frac{1}{N} - \frac{1}{M}) + \frac{p^{2}q^{2}}{S} = ?$
(A) Given expression $= \frac{a^{2}+4a-21}{a^{2}+5a-14} = \frac{a^{2}+7a-3a-21}{a^{2}+7a-2a-14} = \frac{a(a+7)-3(a+7)}{a(a+7)-2(a+7)} = \frac{(a+7)(a-3)}{(a+7)(a-2)} = \frac{a-3}{a-2}$
The value of the lowest form is $\frac{a-3}{a-2}$

(B) Here, $M = p^2 - pq + q^2$, $N = p^2 + pq + q^2$, $R = P^4 + p^2q + q^4$
$\therefore \frac{1}{M} = \frac{1}{p^2 - pq + q^2}$
$\frac{1}{N} = \frac{1}{p^2 + pq + q^2}$
$\frac{2pq}{R} = \frac{2pq}{p^4 + p^4q^2 + q^4}$
Here, $R = p^4 + p^2q^2 + q^4 = (p^2) + 2p^2q^2 + (q^2)^2 - p^2q^2$
$= (p^2 + q^2)^2 - (pq)^2 = (p^2 + q^2 + pq)(p^2 + q^2 - pq)$
Given expression $= \frac{1}{M} - \frac{1}{N} - \frac{2pq}{R} = \frac{1}{p^2 - pq + q^2} - \frac{1}{p^2 + pq + q^2} - \frac{2pq}{(p^2 + p^2 + pq)(p^2 + q^2 - pq)}$
$=\frac{p^2 + pq + q^2 - p^2 + pq - q^2 - 2pq}{(p^2 - pq + q^2)(p^2 - pq + q^2)} = \frac{0}{(p^2 + pq + q^2)(p^2 - pq + q^2)} = 0 $ (Ans)
\overline{f}

(C) Given,
$$M = p^2 - pq + q^2$$
, $N = p^2 + pq + q^2$, $S = P^6 - q^6$
Here, $S = P^6 - q^6$
 $= (p^2)^3 - (q^2)^3 = (p^2 - q^2)(p^4 + p^2q^2 + q^4)$
 $= (p + q)(p - q)(p^2 + pq + q^2)(p^2 - pq + q^2)$
Given expression $= (\frac{1}{M} - \frac{1}{N}) - \frac{p^2q^2}{S} = (\frac{1}{p^2 + pq + q^2} - \frac{1}{p^2 - pq + q^2}) + \frac{p^2q^2}{p^6 - q^6}$
 $= \frac{p^2 - pq + q^2 - p^2 - pq - q^2}{(p^2 + pq + q^2)(p^2 - pq + q^2)} \div \frac{p^2q^2}{(p + q)(p - q)(p^2 + pq + q^2)(p^2 - pq + q^2)}$
 $= \frac{-pq}{(p^2 + pq + q^2)(p^2 - pq + q^2)} \times \frac{(p+q)(p-q)(p^2 + pq + q^2)(p^2 - pq + q^2)}{p^2q^2} = \frac{-2(p+q)(p-q)}{pq} = \frac{-2(p^2 - q^2)}{pq}$
 \therefore The value is $\frac{-2(p^2 - q^2)}{pq}$

POLL - 1

POLL - 1

$$\frac{2p^{2}q^{3}}{3r} \times \frac{6r^{2}}{4p^{2}q^{2}} = ? \qquad [Sylhet. Board: 14]$$
(a) pq
(c) pr
(d) pqr

$$\frac{2p^{2}q^{3}}{4p^{2}q^{2}} = ? \qquad [Sylhet. Board: 14]$$
(b) qr
(d) pqr

$$\frac{2p^{2}q^{3}}{4p^{2}q^{2}} \leq \sqrt{2}$$
(c) pr
(d) pqr

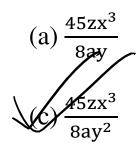
$$\frac{2p^{2}q^{3}}{4p^{2}q^{2}} \leq \sqrt{2}$$
(f) qr

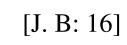
$$\frac{2p^{2}q^{3}}{4p^{2}q^{2}} = ?$$
(f) qr

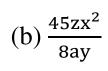
$$\frac{2p^{2}q^{3}}{4p^{2}q^{2}} = ?$$
(f) qr
(g) qr
(g

POLL - 2

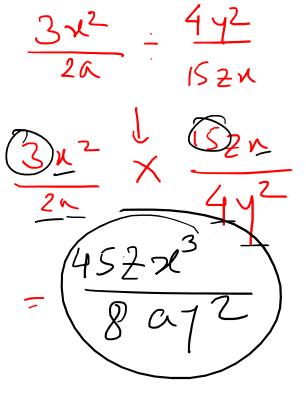
 $\frac{3x^2}{2a} \div \frac{4y^2}{15zx} = ?$



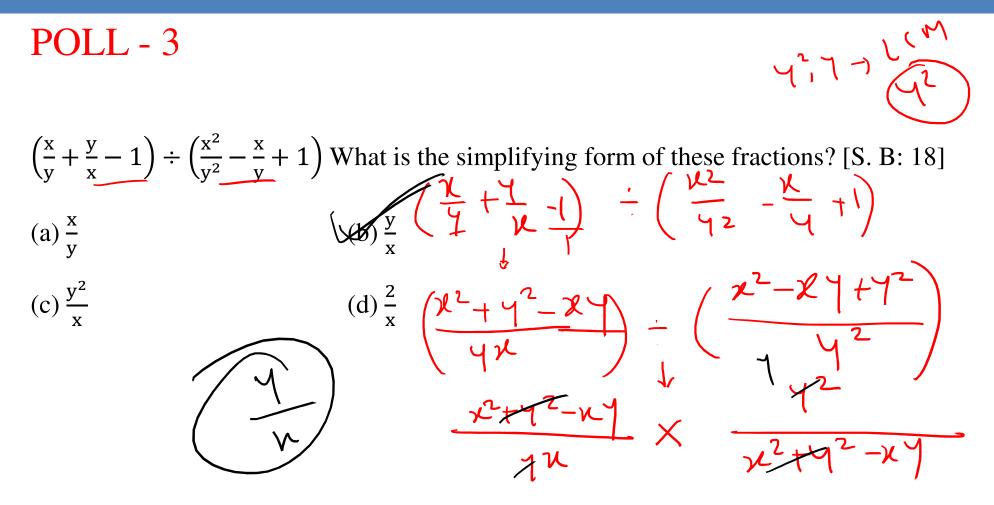




 $(d)\,\frac{45z^2x^2}{8ay^2}$



Mal Div 5.57



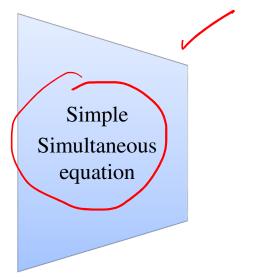
আসসালামু আলাইকুম Chapter- 6.1 Simple Simultaneous Equation

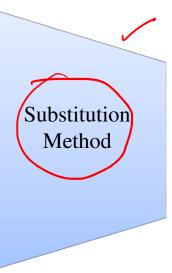
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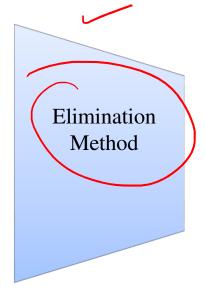


একাডেমিক এন্ড এডমিশন কেয়ার

What will we learn from 6.1?







 $4Y \neq 5$ is an equation. Here x and y are two unknown expressions and variables The variable are of single power. This is an example of simple equation. Here, the pair of L. IT'S = RHS numbers whose sum is equal to 5, will satisfy the equation. For example, the equation will be satisfied by an infinite number of such pairs of number x=4,y=1; or x=3,y=2; or x=2,y=3; or x=1,y=4. 3P+51+10=0 laniables $k^{3} \rightarrow k power 3$ 2 $k^{10} \rightarrow k' \rightarrow power$ Constant SI=5

Here, if we consider the equations x+y=5 and x-y=3, both equations are simultaneously satisfied by x=4 and y=1. If two or more equations connected by the same set of variables, the equations are called simultaneous equations, and if each of the variable is of one dimension, they are known as simple simultaneous equations. Solution = (R.Y)=(GI)

The values of the variables by which equations are satisfied simultaneously, are called the roots or solution of simultaneous equations. Here, the equations x+y=5 and x-y=3are simultaneous equations. Their only solution is x=4,y=1 which can be expressed by (x,y)=(4,1)

POLL-4 2 1+1=X Highest Power

What is the dimension of this equation 2x + 3y = 10? [J. B.-17]

(b) 2

(c) 3 (d) 4

 \sqrt{a} 1

POLL - 5

Which equation is satisfied for these values of the variables (x, y) = (3,4)? (a) x + y = 6 (b) (x + y) = 5 <(c) (x + y) = 7 (d) 2x + 4 = 73 + 4 = 7

Method of solution of simple simultaneous equations

Here, The following two methods of the solution of simple



simultaneous equations of two variables have been discussed .

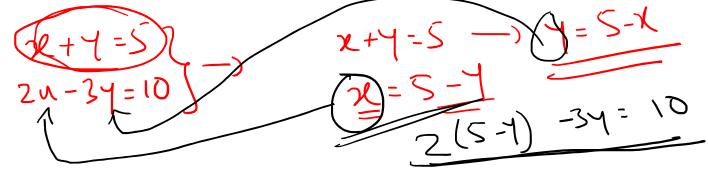
(1) Method of substitution. \checkmark

(2) Method of Elimination. \checkmark

Method of substitution.

Applying this method, we can solve the equations by following the steps below
(1)From any equation , express one variable in terms of the other variable.
(2)Substitute the value of the obtained variable in the other equation and solve the equation in one variable .

(3) Put the obtained value in any of the given equations to find the value of other variable



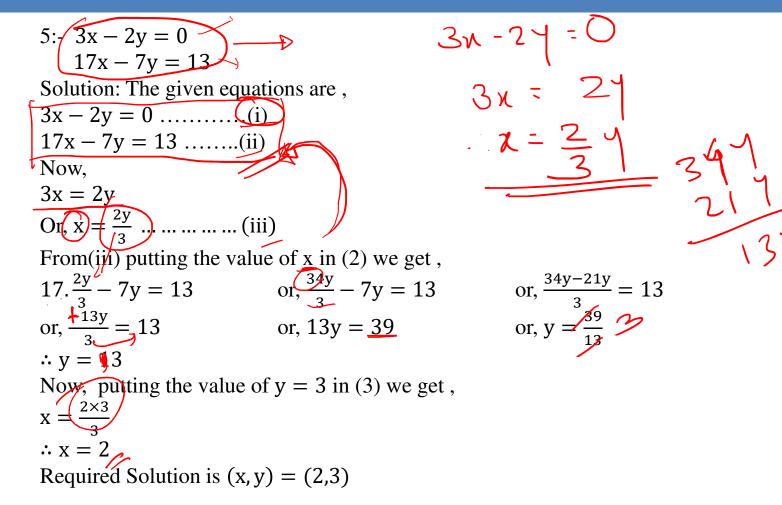
Example Example-1: solve the equations : $\mathbf{x} + \mathbf{y} = \mathbf{7}$ x - y = 3Solution: given equations are, x + y = 7(i) Now x = y + 3(iii) From (iii) putting the value of x in (i) we get, y + 3 + y = 7or, 2y = 7 - 3or, 2y = 4 \therefore y = 2 Here, putting y=2 in equation (iii) we get, x = 2 + 3 $\therefore x = 5$ Required solution is (x, y) = (5, 2)

2+4=

Example

[If we put x=5 and y=2 in both the equations , L.H.S of (i) is 5 + 2 = 7 = R.H.S. and L.H.S of (ii) 5-2=3=R.H.S.]

Exercise



POLL 6:

What is the solution of these equations 2x + y = 5 and 2y = 6? [S.B.-18] (a) (1,3) (b) (3,0) (c) $(\frac{3}{2}, 2)$ (d) $(2, \frac{3}{2})$ 2y = 6 1 = 6 2y = 6? [S.B.-18] 1 = 6 2y = 6? [S.B.-18] 1 = 6 2y = 2 2x = 22x = 5

Method of Elimination

Apply by this method, we can solve the equations by following the steps below:

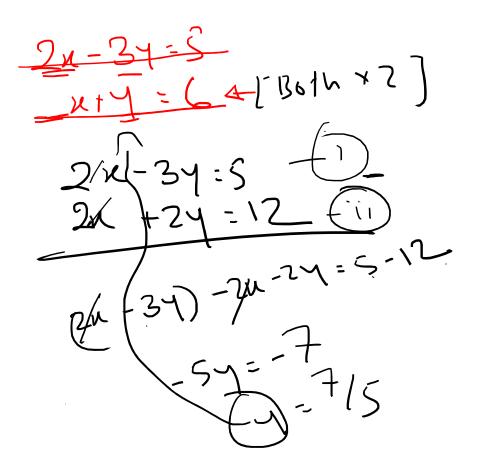
(1) Multiply both the equations by two such separately so that the coefficients of one variable become equal

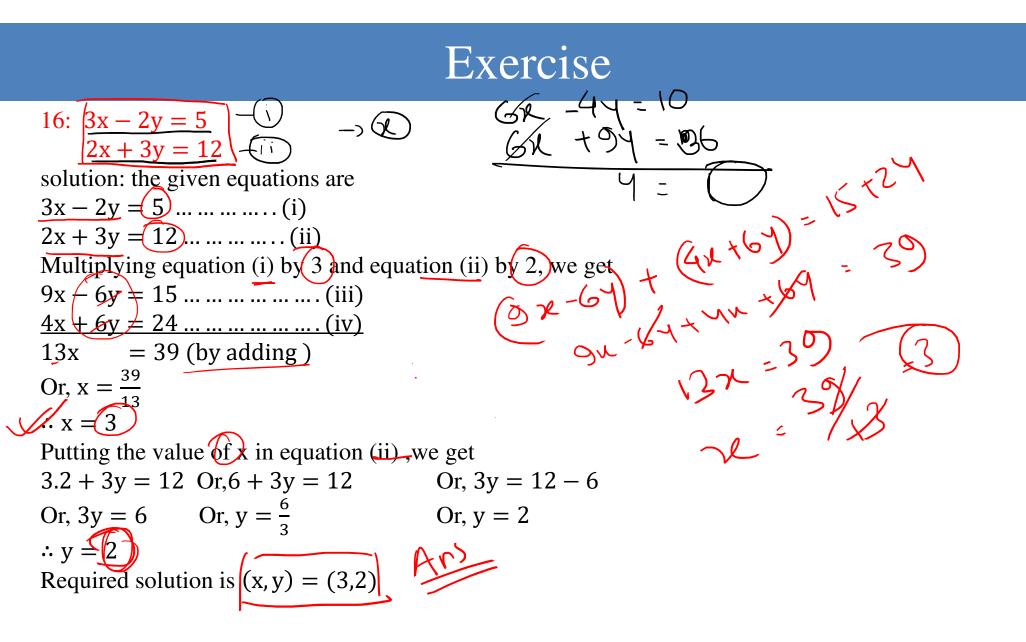
(2) If the coefficients of a variable are of the same opposite sign, subtract or add the equations. The equation after subtraction (or addition) will be reduced to an equation of one variable.

(3) Find the value of a variable by the method o solution of simple equation .
 (4) Put the value of a variable of the variable in any one of the given equations and find the value of the other variable .

Exercise

13: Solution: the given equations are $\underline{\mathbf{x}} + \underline{\mathbf{y}} = 6 \dots \dots \dots \dots \dots (\mathbf{i})$ = 10(by adding) 2xOr, $x = \frac{10}{2}$ $\therefore x \neq 5$ Putting the value of x in equation (ii) we get, 5 + y = 6Or, y = 6 - 5 = 1Required solution is (x, y) = (5, 1)





x+x=5 **POLL - 7** R-X + 22 If x + y = 5 and x - y = 7, then (x, y) = ? [R. B.-18] i x= (a) (6,1) (b) (6, −1) (c) (1,6) (d) (-1,6) 6 + 4 = 54 = 5 - 6 = (-, (61

Creative question:

লেগে থাকো সৎভাবে, স্বপ্ন জয় তোমারই হবে

'র্দ্দ্রান্স-উন্মেষ শিক্ষা পরিবার