ALGEBRA - 2

- **Sandeep Geedh,** Shri Madhavrao Bhagwat High School,
Vile Parle (E), Mumbai-57.

UNIT TEST : 1ST (ANSWERS)

Q. 2) (4) $x = \frac{7y-1}{2}$ & $\frac{x-y}{7} = \frac{x-2y}{4}$

$2x = 7y - 1$ — $4(x-y) = 7(x-2y)$

$2x - 7y = -1$ ...(I) — $4x - 4y = 7x - 14y$

$\therefore -3x + 10y = 0$ ...(II) 1

Multiplying equation (I) by 3 & equation (II) by 2

$6x - 21y = -3$ ... (III)

$-6x + 20y = 0$ ... (IV)

Adding equation (III) & (IV)

$\cancel{6x} - 21y = -3$ ...(III)

$+ \cancel{-6x} + 20y = 0$ ...(IV)

$-y = -3$ $\boxed{\therefore y = 3}$ 1

Substituting y = 3 in equation (I)

$2x - 7y = -1$ ... (I)

$2x - 7(3) = -1$

$2x - 21 = -1$

$\therefore 2x = -1 + 21 \quad \therefore 2x = 20 \quad \therefore x = \frac{20}{2} = \boxed{10}$ 1

$\therefore$ x = 10 & y = 3 is the solution of the given equations.

(5) Let $p(m) = 2m^3 - 5m^2 - 22m - 15$

(the sum of the coefficients of odd power in p(m)) = (the sum of the coefficients of even powers of p(m)) = -20

$\therefore$ (m+1) is a factor of p(m)

Let us find the other factor by synthetic division.

-1	2	-5	-22	-15
		-2	7	15
	2	-7	-15	(0) = R

$\therefore$ the other factor $= 2m^2 - 7m - 15$

$= 2m^2 - 10m + 3m - 15$

$= 2m(m-5) + 3(m-5)$

$= (m-5)(2m+3)$

$\therefore p(m) = 2m^3 - 5m^2 - 22m - 15$

$= \underline{(m+1)(m-5)(2m+3)}$

(6) $\frac{y^2 - 3y + 2}{y^2 - 5y + 4} + \frac{y^2 - 5y + 6}{y^2 - 9y + 20}$

$= \frac{\cancel{(y-1)}(y-2)}{\cancel{(y-1)}(y-4)} + \frac{y^2 - 5y + 6}{(y-4)(y-5)}$ 1

$= \frac{y-2}{y-4} + \frac{y^2 - 5y + 6}{(y-4)(y-5)}$

$= \frac{(y-2)(y-5) + (y2 - 5y + 6}{(y-4) \times (y-5)}$ ½

$= \frac{y^2 - 7y + 10 + y^2 - 5y + 6}{(y-4)(y-5)}$ ½

$= \frac{2y^2 - 12y + 16}{(y-4)(y-5)} = \frac{2(y^2 - 6y + 8)}{(y-4)(y-5)}$ ½

$= \frac{2(y-2)\cancel{(y-4)}}{(y-4)\cancel{(y-5)}}$

$= \boxed{\frac{2(y-2)}{(y-5)}}$ ½

Q. 3 (1) G.C.D. = (x + 3)

L.C.M. $= x^3 - 7x + 6 = x^3 + 0x^2 - 7x^1 + 6x^0$

The sum of the coefficient is zero

$\therefore$ (x-1) is a factor at the polynomial. ½

Let us find the other factor by synthetic division.

1	1	0	-7	6
		1	1	-6
	1	1	-6	(0) = R

$\therefore$ the other factor $= x^2 + x - 6$

$= (x+3)(x-2)$

$\therefore$ L.C.M. = (x-1) (x+3) (x-2) ½

$p(x) = x^2 + 2x - 3 = (x+3)(x-1)$ ...... (given) ½

q(x) is to be found.

p(x) x q(x) = HCF × LCM ½

(x+3) (x-1) x q(x) = (x+3) × (x-1) (x+3) (x-2)

$\therefore$ q(x) = (x+3) (x-2) ... (Dividing both the sides by (x+3) (x-1) ½

$= x^2 + x - 6$

$\therefore$ The other polynomial $= x^2 + x - 6$ ½

(2) y = 2x - 19

$\therefore$ 2x - y = 19 (I)

2x - 3y + 3 = 0

2x - 3y = -3 (II)

$\therefore D = \begin{vmatrix} 2 & -1 \\ 2 & -3 \end{vmatrix} = 2 \times (-3) - (-1) \times 2 = -6 + 2 = -4$ 1

$Dx = \begin{vmatrix} 19 & -1 \\ -3 & -3 \end{vmatrix} = 19 \times (-3) - (-1) \times (-3) = -57 - 3 = -60$ 1

$Dy = \begin{vmatrix} 2 & 19 \\ 2 & -3 \end{vmatrix} = 2 \times (-3) - 2 \times 19 = -6 - 38 = -44$ 1

Applying Cramer's Rule

$\therefore x = \frac{Dx}{D} = \frac{-60}{-4} = 15$ & $y = \frac{Dy}{D} = \frac{-44}{-4} = \boxed{11}$ 1

$\therefore$ the solution of the given equations : x = 15 & y = 11

(3) $[\frac{1+y}{1-y} - \frac{1-y}{1+y} + \frac{4y}{1-y^2}] \div \frac{2y^4}{1-y^4}$

$= \left[\frac{(1+y)^2 - (1-y)^2}{(1-y)(1+y)} + \frac{4y}{1+y^2}\right] \div \frac{2y^4}{1-y^4}$ ½

$= \left[\frac{1 + 2y + y^2 - 1 + 2y - y2}{1 - y^2} + \frac{4y}{1+y^2}\right] \div \frac{2y^4}{1-y^4}$ ½

$= \left[\frac{4y}{1-y^2} + \frac{4y}{1+y^2}\right] \div \frac{2y^4}{1-y^4}$ 1

$= 4y\left[\frac{1}{1-y^2} + \frac{1}{1+y^2}\right] \times \frac{2y^4}{1-y^4}$ ½

$= 4y\left[\frac{1+y^2 + 1-y^2}{(1-y^2)(1+y^2)}\right] \times \frac{1 - y^4}{2y^4}$ ½

$= 4\left[\frac{1}{(1-y^4)}\right] \times \frac{(1-y^4)}{y^3}$ ½

$= \boxed{\frac{4}{y^3}}$ ½

उद्याचा विषय : भूगोल-अर्थशास्त्र (नमुना उत्तरपत्रिका)

लोकसत्ता यशस्वी भव! दहावी अभ्यास मालिका

संपर्क : yashasvibhava2008@gmail.com