C.W
27.7.21

Addition of Polynomials – (Exercise-19B)

(1) i) $(3a + 4b + 7c) + (-5a + 3b - 6c) + (4a - 2b - 4c)$

$= 3a + 4b + 7c - 5a + 3b - 6c + 4a - 2b - 4c$

$= 3a - 5a + 4a + 4b + 3b - 2b + 7c - 6c - 4c$

$= 2a + 5b + (-3c)$

$= 2a + 5b - 3c$ [Row Method]

i) $(3a + 4b + 7c) + (-5a + 3b - 6c) + (4a - 2b - 4c)$

$$\begin{array}{r} 3a + 4b + 7c \\ -5a + 3b - 6c \\ 4a - 2b - 4c \\ \hline 2a + 5b - 3c \end{array}$$

[Column Method]

EXERCISE-19(B)

(1) i) $2x^2 + xy - y^2$, $-x^2 + 2xy + 3y^2$ and $3x^2 - 10xy + 4y^2$

$$\begin{array}{r} 2x^2 + 1xy - 1y^2 \\ -1x^2 + 2xy + 3y^2 \\ 3x^2 - 10xy + 4y^2 \\ \hline 4x^2 - 7xy + 6y^2 \end{array}$$

[Column Method]

iii) $x^2 - x + 1$, $-5x^2 + 2x - 2$ and $3x^2 - 3x + 1$

$$\begin{array}{r} 1x^2 - 1x + 1 \\ -5x^2 + 2x - 2 \\ 3x^2 - 3x + 1 \\ \hline -x^2 - 2x + 0 \end{array}$$

[Column Method]

iv) $a^2 - ab + bc$, $2ab + bc - 2a^2$ and $-3bc + 3a^2 + ab$

$$\begin{array}{r} 1a^2 - 1ab + 1bc \\ -2a^2 + 2ab + 1bc \\ \hline 3a^2 + 1ab - 3bc \\ \hline 2a^2 - 2ab - bc \end{array}$$

[Column Method]

v) $4x^2 + 7 - 3x$, $4x - x^2 + 8$ and $-10 + 5x - 2x^2$.

$$\begin{array}{r} 4x^2 + 7 - 3x \\ -1x^2 + 8 + 4x \\ -2x^2 - 10 + 5x \\ \hline x^2 - 5 + 6x \end{array}$$

[Column Method]

vi) $3x + 4xy - y^2$, $xy - 4x + 2y^2$ and $3y^2 - xy + 6x$.

$$\begin{array}{r} 3x + 4xy - 1y^2 \\ -4x + 1xy + 2y^2 \\ +6x - 1xy + 3y^2 \\ \hline 5x + 4xy + 4y^2 \end{array}$$

[Column Method]

Q) i) $-17x^2 - 2xy + 23y^2$, $-9y^2 + 15x^2 + 7xy$ and $13x^2 + 3y^2 - 4xy$.

$$\begin{array}{r} -17x^2 - 2xy + 23y^2 \\ +15x^2 + 7xy - 9y^2 \\ +13x^2 - 4xy + 3y^2 \\ \hline x^2 + xy + 17y^2 \end{array}$$

[Column Method]

(ii) $-x^2 - 3xy + 3y^2 + 8$, $3x^2 - 5y^2 - 3 + 4xy$ and $-6xy + 2x^2 - 2 + y^2$.

$$\begin{array}{r} -1x^2 - 3xy + 3y^2 + 8 \\ 3x^2 + 4xy - 5y^2 - 3 \\ 2x^2 - 6xy + 1y^2 - 2 \\ \hline 4x^2 - 5xy - y^2 + 3 \end{array}$$

[Column method]

(iii) $a^3 - 2b^3 + a$, $b^3 - 2a^3 + b$ and $-2b + 2b^3 - 5a + 4a^3$

$(a^3 - 2b^3 + a) + (b^3 - 2a^3 + b) + (-2b + 2b^3 - 5a + 4a^3)$

$= a^3 - 2b^3 + a + b^3 - 2a^3 + b - 2b + 2b^3 - 5a + 4a^3$

$= (a^3 - 2a^3 + 4a^3) + (-2b^3 + b^3 + 2b^3) + (a - 5a) + (b - 2b)$

$= 3a^3 + b^3 - 4a - b$. (Ans)

[Row Method]

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Subtraction in Polynomial – (Exercise-19B)

~~4a + 2b - 3c , 6a - 5b + 8c , -2a + 3b + 2c~~

④ i) Subtract:
5a - 3b + 2c from a - 4b - 2c

(a - 4b - 2c) - (5a - 3b + 2c)
= a - 4b - 2c - 5a + 3b - 2c
= a - 5a - 4b + 3b - 2c - 2c
= -4a - b - 4c (Ans)

[Row Method]

i) 5a - 3b + 2c from a - 4b - 2c

$$\begin{array}{r} a - 4b - 2c \\ (-)\ 5a - 3b + 2c \\ \hline -4a - b - 4c \end{array}$$

[Column method]

Exercise – 19(B)

③ i) 3a - (a + 2b)
= 3a - a - 2b
= 2a - 2b (Ans)

ii) (5x - 3y) - (x + y)
= 5x - 3y - x - y
= 5x - x - 3y - y
= 4x - 4y (Ans)

iii) (8a + 15b) - (3b - 7a)
= 8a + 15b - 3b + 7a
= 8a + 7a + 15b - 3b
= 15a + 12b. (Ans)

iv) $(8x + 7y) - (4y - 3x)$

$= 8x + 7y - 4y + 3x$

$= 8x + 3x + 7y - 4y$

$= 11x + 3y$ (Ans)

v) $7 - (4a - 5)$

$= 7 - 4a + 5$

$= 7 + 5 - 4a$

$= 12 - 4a$ (Ans)

vi) $(6y - 13) - (4 - 7y)$

$= 6y - 13 - 4 + 7y$

$= 6y + 7y - 13 - 4$

$= 13y - 17$ (Ans)

(4) Subtract :-

i) $4x - 6y + 3z$ from $12x + 7y - 21z$

$(12x + 7y - 21z) - (4x - 6y + 3z)$

$= 12x + 7y - 21z - 4x + 6y - 3z$

$= 12x - 4x + 7y + 6y - 21z - 3z$

$= 8x + 13y - 24z$

ii) $5 - a - 4b + 4c$ from $5a - 7b + 2c$

$(5a - 7b + 2c) - (5 - a - 4b + 4c)$

$= 5a - 7b + 2c - 5 + a + 4b - 4c$

$= 5a + a - 5 - 7b + 4b + 2c - 4c$

$= 6a - 5 - 3b - 2c$

$= 6a - 3b - 2c - 5$

iv) $-8x - 12y + 17z$ from $x - y - z$.

$$(x - y - z) - (-8x - 12y + 17z)$$
$$= x - y - z + 8x + 12y - 17z$$
$$= 1x + 8x - 1y + 12y - 1z - 17z$$
$$= 9x + 11y - 18z$$

(5) i) Take $-ab + bc - ca$ from $bc - ca + ab$

$$(bc - ca + ab) - (-ab + bc - ca)$$
$$= bc - ca + ab + ab - bc + ca$$
$$= \cancel{bc} - \cancel{bc} - \cancel{ca} + \cancel{ca} + ab + ab$$
$$= 2ab$$

~~$5x + 6y - 3z$ from $3x + 5y - 4z$~~

ii) Take ~~$-ab + bc - ca$ from $bc - ca$~~

$$(3x + 5y - 4z) - (5x + 6y - 3z)$$
$$= 3x + 5y - 4z - 5x - 6y + 3z$$
$$= 3x - 5x + 5y - 6y - 4z + 3z$$
$$= -2x - y - z$$

iii) Take $\frac{-3}{2}p + q - r$ from $\frac{1}{2}p - \frac{1}{3}q - \frac{3}{2}r$.

$$\left(\frac{1}{2}p - \frac{1}{3}q - \frac{3}{2}r\right) - \left(\frac{-3}{2}p + q - r\right)$$
$$= \frac{1}{2}p - \frac{1}{3}q - \frac{3}{2}r + \frac{3}{2}p - q + r$$
$$= \frac{1}{2}p + \frac{3}{2}p - \frac{1}{3}q - q - \frac{3}{2}r + r$$
$$= \frac{4}{2}p - \left(\frac{1}{3}q + \frac{3}{3}q\right) - \left(\frac{3}{2}r - \frac{2}{2}r\right)$$
$$= \frac{4}{2}p - \frac{4}{3}q - \frac{1}{2}r$$

$= 2p - \frac{4}{3}q - \frac{1}{2}r$

iv) Take $1 - a + a^2$ from $a^2 + a + 1$

$(a^2 + a + 1) - (1 - a + a^2)$
$= a^2 + a + 1 - 1 + a - a^2$
$= a^2 - a^2 + a + a + 1 - 1$
$= 2a.$

(4) v) $2ab + cd - ac - 2bd$ from $ab - 2cd + 2ac + bd.$

$(ab - 2cd + 2ac + bd) - (2ab + cd - ac - 2bd)$
$= ab - 2cd + 2ac + bd - 2ab - cd + ac + 2bd$
$= 1ab - 2ab - 2cd - 1cd + 2ac + 1ac + 1bd + 2bd$
$= -ab - 3cd + 3ac + 3bd$

(6) From the sum of $x + y - 2z$ and $2x - y + z$ subtract $x + y + z$.

Solution:- $[(x + y - 2z) + (2x - y + z)] - (x + y + z)$

$= [x + y - 2z + 2x - y + z] - (x + y + z)$
$= [x + 2x + y - y - 2z + z] - (x + y + z)$
$= [3x - z] - (x + y + z)$
$= 3x - z - x - y - z$
$= 3x - x - y - z - z$
$= 2x - y - 2z$ (Ans)

(7) From the sum of $3a-2b+4c$ and $3b-2c$ subtract $a-b-c$.

Sol- $\{(3a-2b+4c)+(3b-2c)\}-(a-b-c)$
$=(3a-2b+4c+3b-2c)-(a-b-c)$
$=(3a-2b+3b+4c-2c)-(a-b-c)$
$=(3a+b+2c)-(a-b-c)$
$=3a+b+2c-a+b+c$
$=3a-a+b+b+2c+c$
$=2a+2b+3c$ (Ans)

(8) Subtract $x-2y-z$ from the sum of $3x-y+z$ and $x+y-3z$.

Sol:- $\{(3x-y+z)+(x+y-3z)\}-(x-2y-z)$
$=[3x-y+z+x+y-3z)-(x-2y-z)$
$=(3x+x-y+y+z-3z)-(x-2y-z)$
$=(4x-2z)-(x-2y-z)$
$=4x-2z-x+2y+z$
$=4x-x+2y-2z+z$
$=3x+2y-z$ (Ans)

(9) Subtract the sum of $x+y$ and $x-z$ from the sum of $x-2z$ and $x+y+z$.

Sol:- $\{(x-2z)+(x+y+z)\}-\{(x+y)+(x-z)\}$
$=(x-2z+x+y+z)-(x+y+x-z)$
$=(x+x+y-2z+z)-(x+x+y-z)$
$=(2x+y-z)-(2x+y-z)$
$=2x+y-z-2x-y+z$
$=2x-2x+y-y-z+z$
$=0$