

Ch-19 Fundamental Operations Ex-19(B)

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

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

ii) $2x^2 + xy - y^2$, $-x^2 + 2xy + 3y^2$ and $3x^2 - 10xy + 4y^2$

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

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

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

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

ans)
$$\begin{aligned} & (a^2 - ab + bc) + (2ab + bc - 2a^2) + (-3bc + 3a^2 + ab) \\ &= a^2 - ab + bc + 2ab + bc - 2a^2 - 3bc + 3a^2 + ab \\ &= a^2 - 2a^2 + 3a^2 - ab + 2ab + ab + bc + bc - 3bc \\ &= a^2 - ab + bc \end{aligned}$$

v) $4x^2 + 7 - 3x$, $4x - x^2 + 8$ and $-10 + 5x - 2x^2$
 ans) $(4x^2 + 7 - 3x) + (4x - x^2 + 8) + (-10 + 5x - 2x^2)$
 $= 4x^2 + 7 - 3x + 4x - x^2 + 8 - 10 + 5x - 2x^2$
 $=$
 $\quad 4x^2 + 7 - 3x$
 $\quad -x^2 + 8 + 4x$
 $\quad + -2x^2 - 10 + 5x$
 $\quad \underline{\quad \quad \quad}$
 $\quad \quad \quad x^2 + 5 + 8x$

vi) $3x + 4xy - y^2$, $xy - 4x + 2y^2$ and $3y^2 - xy + 6x$
 ans) $(3x + 4xy - y^2) + (xy - 4x + 2y^2) + (3y^2 - xy + 6x)$
 $= 3x + 4xy - y^2 + xy - 4x + 2y^2 + 3y^2 - xy + 6x = 3x + 4xy - y^2$
 $\quad - 4x + xy + 3y^2$
 $\quad + 6x - xy + 3y^2$
 $\quad \underline{\quad \quad \quad}$

vii) $-7x^2 - 2xy + 23y^2$, $-9y^2 + 15x^2 + 7xy$ and $13x^2 + 3y^2 - 4xy$, $5x + 4xy + 4y^2$
 ans) $(-7x^2 - 2xy + 23y^2) + (-9y^2 + 15x^2 + 7xy) + (13x^2 + 3y^2 - 4xy)$
 $= -7x^2 - 2xy + 23y^2 - 9y^2 + 15x^2 + 7xy + 13x^2 + 3y^2 - 4xy$
 $= -7x^2 + 15x^2 + 13x^2 - 2xy - 4xy + 7xy + 23y^2 + 3y^2 - 9y^2$
 $= 11x^2 + xy + 17y^2$

viii) $-x^2 - 3xy + 3y^2 + 8$, $3x^2 - 5y^2 - 3 + 4xy$ and $-6xy + 2x^2 - 2 + y^2$
 ans) $(-x^2 - 3xy + 3y^2 + 8) + (3x^2 - 5y^2 - 3 + 4xy) + (-6xy + 2x^2 - 2 + y^2)$
 $= -x^2 - 3xy + 3y^2 + 8 + 3x^2 - 5y^2 - 3 + 4xy - 6xy + 2x^2 - 2 + y^2$
 $= -x^2 + 3x^2 + 2x^2 - 3xy - 6xy + 4xy + 3y^2 - 5y^2 + y^2 - 5y^2$
 $\quad + 8 - 3 - 2$
 $= 4x^2 - 5xy - y^2 - 3$

ix) $a^3 - 2b^3 + a$, $b^3 - 2a^3 + b$ and $-2b + 2b^3 - 5a + 4a^3$
 ans) $(a^3 - 2b^3 + a) + (b^3 - 2a^3 + b) + (-2b + 2b^3 - 5a + 4a^3)$
 $= a^3 - 2b^3 + a + b^3 - 2a^3 + b - 2b + 2b^3 - 5a + 4a^3$
 $= a^3 - 2a^3 + 4a^3 - 2b^3 + 2b^3 + a - 5a + b - 2b$
 $= 3a^3 + b^3 - 4a - b$

$$\begin{aligned} \text{iii)} & 3a - (a + 2b) \\ \text{ans)} & 3a - (a + 2b) \\ & = 3a - a - 2b \\ & = 2a - 2b \end{aligned}$$

$$\begin{aligned} \text{iv)} & (5x - 3y) - (x + y) \\ \text{ans)} & (5x - 3y) - (x + y) \\ & = 5x - 3y - x - y \\ & = 5x - x - 3y - y \\ & = 4x - 4y \end{aligned}$$

$$\begin{aligned} \text{v)} & (8a + 15b) - (3b - 7a) \\ \text{ans)} & (8a + 15b) - (3b - 7a) \\ & = 8a + 15b - 3b + 7a \\ & = 8a + 7a + 15b - 3b \\ & = 15a + 12b \end{aligned}$$

$$\begin{aligned} \text{vi)} & (8x + 7y) - (4y - 3x) \\ \text{ans)} & (8x + 7y) - (4y - 3x) \\ & = 8x + 7y - 4y + 3x \\ & = 8x + 3x + 7y - 4y \\ & = 11x + 3y \end{aligned}$$

$$\begin{aligned} \text{vii)} & 7 - (4a - 5) \\ \text{ans)} & = 7 - 4a + 5 \\ & = 7 + 5 - 4a \\ & = 12 - 4a \end{aligned}$$

$$\begin{aligned} \text{viii)} & (6y - 13) - (4 - 7y) \\ \text{ans)} & = 6y - 13 - 4 + 7y \\ & = 6y + 7y - 13 - 4 \\ & = 13y - 17 \end{aligned}$$

HW
28/9/21

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

$$\begin{aligned} \text{ans) } & (a - 4b - 2c) - (5a - 3b + 2c) \\ & = a - 4b - 2c - 5a + 3b - 2c \\ & = a - 5a - 4b + 3b - 2c - 2c \\ & = -4a - b - 4c \end{aligned}$$

ii) $4x - 6y + 3z$ from $12x + 7y - 2z$

$$\begin{aligned} \text{ans) } & (12x + 7y - 2z) - (4x - 6y + 3z) \\ & = 12x + 7y - 2z - 4x + 6y - 3z \\ & = 12x - 4x + 7y + 6y - 2z - 3z \\ & = 8x + 13y - 5z \end{aligned}$$

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

$$\begin{aligned} \text{ans) } & (5a - 7b + 2c) - (5 - a - 4b + 4c) \\ & = 5a - 7b + 2c - 5 + a + 4b - 4c \\ & = 5a + a - 7b + 4b + 2c - 4c - 5 \\ & = 6a - 3b - 2c - 5 \end{aligned}$$

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

$$\begin{aligned} \text{ans) } & (x - y - z) - (-8x - 12y + 17z) \\ & = x - y - z + 8x + 12y - 17z \\ & = x + 8x - y + 12y - z - 17z \\ & = 9x + 11y - 18z \end{aligned}$$

v) $2ab + cd - ac - 2bd$ from $ab - 2cd + 2ac + bd$

$$\begin{aligned} \text{ans) } & (ab - 2cd + 2ac + bd) - (2ab + cd - ac - 2bd) \\ & = ab - 2cd + 2ac + bd - 2ab - cd + ac + 2bd \\ & = ab - 2ab - 2cd - cd + 2ac + ac + bd + 2bd \\ & = -ab - 3cd + 3ac + 3bd \end{aligned}$$

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

$$\text{ans} (bc - ca + ab) - (-ab + bc - ca)$$

$$= bc - ca + ab + ab - bc + ca$$

$$= bc - bc - ca + ca + ab + ab$$

$$= 2ab$$

ii) Take $5x + 6y - 3z$ from $3x + 5y - 4z$

$$\text{ans} (3x + 5y - 4z) - (5x + 6y - 3z)$$

$$= 3x + 5y - 4z - 5x - 6y + 3z$$

$$= 3x - 5x + 5y - 6y - 4z + 3z$$

$$= 2x - y - z$$

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

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

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

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

$$= \frac{3p + 9p - 2q - 6q - 9r + 6r}{6}$$

6

[Since LCM = 6]

$$= \frac{12p - 8q - 3r}{6}$$

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

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

$$\text{ans} (a^2 + a + 1) - (1 - a + a^2)$$

$$= a^2 + a + 1 - 1 + a - a^2$$

$$= a^2 - a^2 + a + a + 1 - 1$$

$$= 2a$$

6)

Solⁿ ans) Sum:
$$\begin{array}{r} x + y - 2z \\ + 2x - y + z \\ \hline 3x - z \end{array} \quad + y - y = 0$$

Subtract: $(3x - z) - (x + y + z)$
 $= 3x - z - x - y - z$
 $= 3x - x - y - z - z$
 $= 2x - y - 2z$

7)

Solⁿ - Sum.
$$\begin{array}{r} 3a - 2b + 4c \\ + 3b - 2c \\ \hline 3a + b + 2c \\ a - b - c \\ - + + \\ \hline -2a + 2b + 3c \end{array}$$

8)

Solⁿ -
$$\begin{aligned} & \{(3x - y + z) + (x + y - 3z)\} - (x - 2y - z) \\ &= \{3x - y + z + x + y - 3z\} - (x - 2y - z) \\ &= \{3x + x - y + y + z - 3z\} - (x - 2y - z) \\ &= (4x - 2z - (x - 2y - z)) \\ &= 4x - 2z - x + 2y + z \\ &= 4x - x + 2y - 2z + z \\ &= 3x + 2y - z \end{aligned}$$

9)

$$\begin{aligned}
 \text{ans)} & \{(x-2z) + (x+y+z)\} - \{(x+y) + (x-z)\} \\
 & = \{x-2z+x+y+z\} - \{x+y+x-z\} \\
 & = \{x+x+y-2z+z\} - \{x+x+y-z\} \\
 & = \{2x+y-z\} - \{2x+y-z\} \\
 & = \{2x+y-z-2x-y+z\} \\
 & = 2x-2x+y-y-z+z \\
 & = 0
 \end{aligned}$$