2.8.21

EXERCISE – 19 (B)

1. Find the Sum of :–

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

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

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

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

$= -2a + 5b - 3c.$

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

$= 2x^2 + xy - y^2 + (-x^2 + 2xy + 3y^2) + 3x^2 - 10xy + 4y^2$

$= 2x^2 + xy - y^2 - x^2 + 2xy + 3y^2 + 3x^2 - 10xy + 4y^2$

$= 2x^2 - x^2 + 3x^2 + xy + 2xy - 10xy - y^2 + 4y^2 + 3y^2$

$= 4x^2 - 7xy + 6y^2$

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

$= x^2 - x + 1 + (-5x^2 + 2x - 2) + 3x^2 - 3x + 1$

$= x^2 - x + 1 - 5x^2 + 2x - 2 + 3x^2 - 3x + 1$

$= x^2 - 5x^2 + 3x^2 - x + 2x - 3x + 1 - 2 + 1$

$= -x^2 - 2x$.

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

$= a^2 - ab + bc + 2ab + bc - 2a^2 + (-3bc + 3a^2 + ab)$

$= a^2 - ab + bc + 2ab + bc - 2a^2 - 3bc + 3a^2 + ab)$

$= a^2 - 2a^2 + 3a^2 - ab + 2ab + ab + bc + bc - 3bc$

$= 2a^2 + 2ab - bc$

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

$= 4x^2 + 7 - 3x + 4x - x^2 + 8 + (-10 + 5x - 2x^2)$

$= 4x^2 + 7 - 3x + 4x - x^2 + 8 - 10 + 5x - 2x^2$

$= 4x^2 - x^2 - 2x^2 + 7 + 8 - 10 - 3x + 4x + 5x$

$= x^2 + 5 + 6x$

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

$= 3x + 4xy - y^2 + xy - 4x + 2y^2 + 3y^2 - xy + 6x$

$= 3x - 4x + 6x + 4xy + xy - xy - y^2 + 2y^2 + 3y^2$

$= 5x + 4xy + 4y^2$

2. Add the following expressions :

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

$\therefore -17x^2 - 2xy + 23y^2 + (-9y^2 + 15x^2 + 7xy + 13x^2 + 3y^2 - 4xy)$

$= -17x^2 - 2xy + 23y^2 - 9y^2 + 15x^2 + 7xy + 13x^2 + 3y^2 - 4xy$

$= -17x^2 + 15x^2 + 13x^2 - 2xy + 7xy - 4xy + 23y^2 - 9y^2 + 3y^2$

$= 11x^2 + xy - 7y^2$

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

$= -x^2 - 3xy + 3y^2 + 8 + 3x^2 - 5y^2 - 3 + 4xy + (-6xy + 2x^2 - 2 + y^2)$

$= -x^2 - 3xy + 3y^2 + 8 + 3x^2 - 5y^2 - 3 + 4xy - 6xy + 2x^2 - 2 + y^2$

$= -x^2 + 3x^2 + 2x^2 - 3xy + 4xy - 6xy + 3y^2 - 5y^2 + y^2 + 8 - 3 - 2$

$= 4x^2 - 5xy - y^2 + 3$

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

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

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

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

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

3. Evaluate:

i) $3a - (a + 2b)$

$= 3a - a - 2b$

$= 2a - 2b$

ii) $(5x - 3y) - (x + y)$

$= 5x - x - 3y - y$

$= 4x - 4y$

iii) $(8a + 15b) - (3b - 7a)$

$= 8a + 7a + 15b - 3b$

$= 15a + 12b$

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

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

$= 11x + 3y$

v) $7-(4a-5)$
$= 7-4a+5$
$= 12-4a$

vi) $(6y-13)-(4-7y)$
$= 6y-4-13+7y$
$= 6y+7y-4-13$
$= 13y-17$

4. Subtract :—

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

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

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

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

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

$=(12x+7y-21z)-(4x-6y+3z)$
$= 12x+7y-21z-4x+6y-3z$
$= 12x-4x+7y+6y-21z-3z$
$= 8x+13y-24z$

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

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

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

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

5.

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

$=(bc-ca+ab)-(-ab+bc-ca)$
$=bc-ca+ab+ab-bc+ca$
$=bc-bc-ca+ca+ab+ab$
$=2ab$.

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

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

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

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

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

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

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

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

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

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

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

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

$= 2a$

6. From the Sum of $x + y - 2z$ and $2x - y + z$ Subtract $x + y + z$.

Sum: $x + y - 2z + 2x - y + z$

$= x + 2x + y - y - 2z + z$

$= 3x - z$

Sub: $(3x - z) - (x + y + z)$

$= 3x - z - x - y - z$

$= 3x - x - z - z - y$

$= 2x - 2z - y$

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

Sum: $3a - 2b + 4c + 3b - 2c$.
$= 3a - 2b + 3b + 4c - 2c$
$= 3a + b + 2c$

sub: $(3a + b + 2c) - (a - b - c)$
$= 3a + b + 2c - a + b + c$
$= 3a - a + b + b + 2c + c$
$= 2a + 2b + 3c$

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

Sum: $3x - y + z + x + y - 3z$
$= 3x + x - y + y + z - 3z$
$= 4x - 2z$

Subtract: $(4x - 2z) - (x - 2y - z)$
$= 4x - 2z - x + 2y + z$
$= 4x - x - 2z + z + 2y$
$= 3x - z + 2y$

9. Subtract the Sum of $x + y$ and $x - z$ from the Sum of $x - 2z$ and $x + y + z$.

Sum: $x + y + x - z$
$= x + x + y - z$
$= 2x + y - z$

Sum: $x - 2z + x + y + z$

$= x + x - 2z + z + y$

$= 2x - z + y$

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

$= 2x - z + y - 2x - y + z$

$= 2x - 2x - z + z + y - y$

$= 0$