## More on Addition and Subtraction.

### Addition of Polynomials [Row method]

Exercise 19(B)

1- Find the sum of:

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

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

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

$=2a+5b+7c-10c$

$=2a+5b-3c$

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

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

$=(2x^2+3x^2$

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

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

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

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

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

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

$=-4x^2+3x^2+x-3x-1+1$

$=-x^2-2x-0$

$=-x^2-2x$

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

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

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

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

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

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

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

$=3x^2-2x^2+15-10+3x+5x$

$=x^2+5+8x$

2. Add the following expressions:

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

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

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

$=-2x^2+13x^2+5xy-4xy+14y^2+3y^2$

$=11x^2+9xy+17y^2$

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

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

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

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

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

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

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

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

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

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

3. Evaluate

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

Soln: $=3a-a-2b$

$=2a-2b$

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

Soln: $=5x-3y-x-y$

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

$=4x+2y$

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

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

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

$=15a+12b$

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

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

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

$=11x+3y$

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

Soln: $=7-4a+5$

$=7+5-4a$

$=12-4a$

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

Soln: $=(6y-13)-4-7y$

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

$=-y-17$

4. Subtract

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

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

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

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

$= -4a-b-4c$

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

Sol: $=(12x+7y-2z)-(4x-6y+3z)$

$=(12x+7y-2z)-(4x+6y-3z$

$= 12x-4x+7y+6y-2z-3z$

$= 8x+13y-2z$

(c) $5a-3b+2c$ from $5a-7b+2c$

Sol: $=(5a-7b+2c)-(5a-3b+2c)$

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

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

$= -a-4b-c$

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

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

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

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

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

(e) $-8x-12y+17z$ from $x-y-z$

Sol: $=(x-y-z)-(-8x-12y+17z)$

$=(x-y-z)+(+8x+12y-17z$

$= x-y-z+8x+12y-17z$

$= x+8x-y+12y-z-17z$

$= 9x+11y-18z$

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

Sol: $=(2ab-2cd+2ac+bd)-(2ab+cd-ac-2bd)$

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

$= ab-2ab-2cd+2ac+ac+bd+2bd$

$= -ab-3cd+3ac+3bd$

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

Sol$^n$: $= (bc-ca+ab)-(-ab+bc+ca)$

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

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

$= 2ab$

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

Sol$^n$: $= (3x+5y-4z)-(5x+6y-3z)$

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

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

$= -2x-y-z$

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

Sol$^n$: $= (\frac{1}{2}p-\frac{1}{3}q-\frac{3}{2}r)-(-\frac{3}{2}p+q-r)$

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

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

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

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

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

Sol$^n$: $= (a^2+a+1)-(1-a+a^2)$

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

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

$= 0+2a+0$

$= 2a$

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

Sol$^n$: $=$ The sum of $x+y-2z$ and $2x-y+z$

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

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

$= 3x-0-z$

$= 3x-z$

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

Sol$^n$: The sum of $x+y-2z$ and $2x-y+z$

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

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

$= 3x-0-z$

$= 3x-z$

7. Subtract $x+y+z$ from $3x-z$

$= (3x-z)-(x+y+z)$

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

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

$= 2x-2z-y$

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

Sol$^n$: The sum of $3a-2b+4c$ and $3b-2c$

$= 3a-2b+4c+3b-2c$

$= 3a-2b+3b+4c-2c$

$= 3a+b+2c$

Subtract $a-b-c$ from $3a+b+2c$

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

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

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

$= 2a+2b+3c$

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

Sol$^n$: The sum of $3x-y+z$ and $x+y-3x$

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

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

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

$= x+z$

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

Sol$^n$: The sum of $x+y$ and $x-z$

$= x+y+x-z$

$= x+x+y-z$

$= 2x+y-z$

The sum of $x-2z$ and $x+y+z$

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

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

$= 2x-z+y$

Subtract $2x+y-z$ from $2x-z+y$

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

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

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

$= 0$

Exercise 19(c)

2. Find the value of:

i $3x^3 \times 5x^4$

Soln:-

1. Fill in the blanks.

i $6 \times 3 =$ 18 and $6x \times 3x =$ $18x^2$

ii $6 \times 3 =$ 18 and $6x^2 \times 3x^3 =$ $18x^5$

iii $5 \times 4 =$ 20 and $5x \times 4y =$ $20xy$

iv $4 \times 7 =$ 28 and $4ax \times 7x =$ $28ax^2$

v $6 \times 2 =$ 12 and $6xy \times 2xy =$ $12x^2y^2$

vi $12 \times 4 =$ 48 and $12ax^2 \times 4ax =$ $48a^2x^3$

vii $1 \times 8 =$ 8 and $a^2xy^2 \times 8a^3x^2y =$ $8a^5x^3y^3$

viii $15 \times 3 =$ 45 and $15x \times 3x^5y^2 =$ ____