RS Aggarwal Solutions for Class 6 Maths Chapter 8 – Algebraic Expressions

Exercise 8A

PAGE NO: 130

1.

Solution

(i) x increased by 12 is written as x + 12

(ii) y decreased by 7 is written as y – 7

(iii) The difference of a and b, when a > b is (a – b)

(iv) The product of x and y is xy, added to their sum is (x + y)

Hence, the product of x and y added to their sum is (x + y) + xy

(v) One third of x = x / 3

Sum of a and b = (a + b)

∴ One third of x multiplied by the sum of a and b = x / 3 × (a + b)

= x (a + b) / 3

(vi) 5 times x = 5x, seven times y = 7y

∴ 5 times x added to seven times y is written as 7y + 5x

(vii) Sum of x = x

Quotient of y = y / 5

∴ Sum of x and the quotient of y by 5 = x + y / 5

(viii) x taken away from 4 is written as (4 – x)

(ix) Quotient of x by y = x / y

∴ 2 less than the quotient of x by y = (x / y) – 2

(x) x multiplied by itself is x × x = x^2

∴ x multiplied by itself is written as x^2

(xi) Twice x increased by y is written as (2x + y)

(xii) Thrice x = 3 × x = 3x and y squared = (y × y) = y^2

∴ Thrice x added to y squared is written as 3x + y^2

(xiii) Twice y = 2 × y = 2y

∴ x minus twice y is written as (x – 2y)

(xiv) x cubed = (x × x × x) = x^3 y cubed = (y × y × y) = y^3

∴ x cubed less than y cubed is written as (y^3 – x^3)

(xv) The quotient of x by 8 is x / 8

∴ The quotient of x by 8 is multiplied by y is written as (x / 8) × y

2.

Solution

Marks scored by Ranjit in English = 80

Marks scored by Ranjit in Hindi = x

Total score in the two subjects = (Marks in English) + (Marks in Hindi)

= (80 + x)

∴ Total score in the two subjects scored by Ranjit is (80 + x) marks

RS Aggarwal Solutions for Class 6 Maths Chapter 8 – Algebraic Expressions

Exercise 8B

PAGE NO: 132

1.

Solutions

Given a = 2 and b = 3

(i) a + b

Substituting a = 2 and b = 3 in the given expression, we get

a + b = 2 + 3

= 5

∴ a + b = 5

(ii) a^2 + ab

Substituting a = 2 and b = 3 in the given expression, we get

a^2 + ab = $(2)^2$ + (2) × (3)

= (2 × 2) + (2 × 3)

= 4 + 6

= 10

∴ a^2 + ab = 10

(iii) ab – a^2

Substituting a = 2 and b = 3 in the given expression, we get

ab – a^2 = (2 × 3) – $(2)^2$

= (2 × 3) – (2 × 2)

= 6 – 4

= 2

∴ ab – a^2 = 2

(iv) 2a – 3b

Substituting a = 2 and b = 3 in the given expression, we get

2a – 3b = (2 × 2) – (3 × 3)

= 4 – 9

= -5

∴ 2a – 3b = -5

(v) $5a^2$ – 2ab

Substituting a = 2 and b = 3 in the given expression, we get

$5a^2$ – 2ab = 5 × $(2)^2$ – 2 (2) (3)

= (5 × 4) – 2 (2 × 3)

= 20 – 2 (6)

= 20 – 12

= 8

∴ $5a^2 – 2ab = 8$

(vi) $a^3 – b^3$

Substituting a = 2 and b = 3 in the given expression, we get

$a^3 – b^3 = (2)^3 – (3)^3$

= (2 × 2 × 2) – (3 × 3 × 3)

= 8 – 27

=-19

∴ $a^3 – b^3 = -19$

2.

Solutions

Given x = 1, y = 2 and z = 5

(i) 3x – 2y + 4z

Substituting x = 1, y = 2 and z = 5 in the given expression, we get

3x – 2y + 4z = 3 (1) – 2 (2) + 4 (5)

= (3 × 1) – (2 × 2) + (4 × 5)

= 3 – 4 + 20

= 23 – 4

= 19

∴ 3x – 2y + 4z = 19

(ii) $x^2 + y^2 + z^2$

Substituting x = 1, y = 2 and z = 5 in the given expression, we get

$x^2 + y^2 + z^2 = (1)^2 + (2)^2 + (5)^2$

= (1× 1) + (2 × 2) + (5 × 5)

= 1 + 4 + 25

= 30

∴ $x^2 + y^2 + z^2 = 30$

(iii) $2x^2 – 3y^2 + z^2$

Substituting x = 1, y = 2 and z = 5 in the given expression, we get

$2x^2 – 3y^2 + z^2 = 2 (1)^2 – 3(2)^2 + (5)^2$

$= (2 \times 1) - 3\,(2 \times 2) + (5 \times 5)$

$= (2) - 3\,(4) + (25)$

$= 2 - 12 + 25$

$= 27 - 12$

$= 15$

$\therefore 2x^2 - 3y^2 + z^2 = 15$

(iv) $xy + yz - zx$

Substituting x = 1, y = 2 and z = 5 in the given expression, we get

$xy + yz - zx = (1)\,(2) + (2)\,(5) - (5)\,(1)$

$= (1 \times 2) + (2 \times 5) - (5 \times 1)$

$= 2 + 10 - 5$

$= 12 - 5$

$= 7$

$\therefore xy + yz - zx = 7$

(v) $2x^2y - 5yz + xy^2$

Substituting x = 1, y = 2 and z = 5 in the given expression, we get

$2x^2y - 5yz + xy^2 = 2\,(1)^2\,(2) - 5(2)\,(5) + (1)\,(2)^2$

$= 2\,(1 \times 1)\,(2) - 5\,(2 \times 5) + (1 \times 2 \times 2)$

$= 4 - 5\,(10) + (4)$

$= 4 - 50 + 4$

$= 8 - 50$

$= -42$

$\therefore 2x^2y - 5yz + xy^2 = -42$

(vi) $x^3 - y^3 - z^3$

Substituting x = 1, y = 2 and z = 5 in the given expression, we get

$x^3 - y^3 - z^3 = (1)^3 - (2)^3 - (5)^3$

$= (1 \times 1 \times 1) - (2 \times 2 \times 2) - (5 \times 5 \times 5)$

$= (1) - (8) - (125)$

$= 1 - 8 - 125$

$= 1 - 133$

$= -132$

$\therefore x^3 - y^3 - z^3 = -132$

3.

Solutions

Given p = -2, q = -1 and r = 3

(i) $p^2 + q^2 - r^2$

Substituting p = -2, q = -1 and r = 3 in the given expression, we get

$p^2 + q^2 - r^2 = (-2)^2 + (-1)^2 - (3)^2$

$= (-2 \times -2) + (-1 \times -1) - (3 \times 3)$

$= 4 + 1 - 9$

$= 5 - 9$

$= -4$

$\therefore p^2 + q^2 - r^2 = -4$

(ii) $2p^2 - q^2 + 3r^2$

Substituting p = -2, q = -1 and r = 3 in the given expression, we get

$2p^2 - q^2 + 3r^2 = 2(-2)^2 - (-1)^2 + 3(3)^2$

$= 2(-2 \times -2) - (-1 \times -1) + 3(3 \times 3)$

$= 2(4) - (1) + 3(9)$

$= 8 - 1 + 27$

$= 7 + 27$

$= 34$

$\therefore 2p^2 - q^2 + 3r^2 = 34$

(iii) $p - q - r$

Substituting p = -2, q = -1 and r = 3 in the given expression, we get

$p - q - r = (-2) - (-1) - (3)$

$= -2 + 1 - 3$

$= -1 - 3$

$= -4$

$\therefore p - q - r = -4$

(iv) $p^3 + q^3 + r^3 + 3pqr$

Substituting p = -2, q = -1 and r = 3 in the given expression, we get

$p^3 + q^3 + r^3 + 3pqr = (-2)^3 + (-1)^3 + (3)^3 + 3(-2)(-1)(3)$

$= (-2 \times -2 \times -2) + (-1 \times -1 \times -1) + (3 \times 3 \times 3) + 3(-2 \times -1 \times 3)$

$= -8 - 1 + 27 + 18$

$= -9 + 45$

$= 36$

$\therefore p^3 + q^3 + r^3 + 3pqr = 36$

(v) $3p^2q + 5pq^2 + 2pqr$

Substituting p = -2, q = -1 and r = 3 in the given expression, we get

$3p^2q + 5pq^2 + 2pqr = 3(-2)^2(-1) + 5(-2)(-1)^2 + 2(-2)(-1)(3)$

$= 3(-2 \times -2 \times -1) + 5(-2 \times -1 \times -1) + 2(-2 \times -1 \times 3)$

$= 3(-4) + 5(-2) + 2(6)$

$= -12 - 10 + 12$

$= -10$

$\therefore 3p^2q + 5pq^2 + 2pqr = -10$

(vi) $p^4 + q^4 - r^4$

Substituting p = -2, q = -1 and r = 3 in the given expression, we get

$p^4 + q^4 - r^4 = (-2)^4 + (-1)^4 - (3)^4$

$= (-2 \times -2 \times -2 \times -2) + (-1 \times -1 \times -1 \times -1) - (3 \times 3 \times 3 \times 3)$

$= (16) + (1) - (81)$

$= 17 - 81$

$= -64$

$\therefore p^4 + q^4 - r^4 = -64$

4.

Solution

(i) The coefficient of x in 13x is 13

(ii) The coefficient of y in -5y is -5

(iii) The coefficient of a in 6ab is 6b

(iv) The coefficient of z in -7xz is -7x

(v) The coefficient of p in -2pqr is -2qr

(vi) The coefficient of y^2 in $8xy^2z$ is 8xz

(vii) The coefficient of x^3 in x^3 is 1

(viii) The coefficient of x^2 in $-x^2$ is -1

5.

Solutions

(i) The numerical coefficient of ab is 1

(ii) The numerical coefficient of -6bc is -6

(iii) The numerical coefficient of 7xyz is 7

(iv) The numerical coefficient of $-2x^3y^2z$ is -2

RS Aggarwal Solutions for Class 6 Maths Chapter 8 – Algebraic Expressions

Exercise 8C

PAGE NO: 134

1.

Solutions

(i) The required sum = 3x + 7x

= (3 + 7) x

= 10x

(ii) The required sum = 7y + (-9y)

= 7y – 9y

= (7 -9) y

= -2y

(iii) The required sum = 2xy + 5xy + (-xy)

= 2xy + 5xy – xy

= (2x + 5x –x) y

= 6xy

(iv) The required sum = 3x + 2y

= 3x + 2y

(v) The required sum = $2x^2 + (-3x^2) + 7x^2$

= $2x^2 – 3x^2 + 7x^2$

= $(2 – 3 + 7) x^2$

= $6x^2$

(vi) The required sum = 7xyz + (-5xyz) + 9xyz + (-8xyz)

= 7xyz – 5xyz + 9xyz – 8xyz

= (7 – 5 + 9 – 8) xyz

= (16 – 13) xyz

= 3xyz

(vii) The required sum = $6a^3 + (-4a^3) + 10a^3 + (-8a^3)$

= $6a^3 – 4a^3 + 10a^3 – 8a^3$

= $(6 – 4 + 10 – 8) a^3$

= $(16 – 12) a^3$

= $4a^3$

(viii) The required sum = $(x^2 - a^2) + (-5x^2 + 2a^2) + (-4x^2 + 4a^2)$

$= x^2 - a^2 - 5x^2 + 2a^2 - 4x^2 + 4a^2$

$= (1 - 5 - 4)\,x^2 - (1 - 2 - 4)\,a^2$

$= (1 - 9)\,x^2 - (1 - 6)\,a^2$

$= -8x^2 + 5a^2$

2.

Solutions

(i) $x - 3y - 2z$

$5x + 7y - z$

$-7x - 2y + 4z$

$-x + 2y + z$

(ii) $m^2 - 4m + 5$

$-2m^2 + 6m - 6$

$-m^2 - 2m - 7$

$-2m^2 + 0m - 8$

$= -2m^2 - 8$

(iii) $2x^2 - 3xy + y^2$

$-7x^2 - 5xy - 2y^2$

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

$-x^2 - 7xy - 7y^2$

(iv) $4xy - 5yz - 7zx$

$-5xy + 2yz + zx$

$-2xy - 3yz + 3zx$

$-3xy - 6yz - 3zx$

3.

Solution

(i) The sum of the given expressions

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

$= 4a + 2b - c$

(ii) The sum of the given expressions

$= (8a - 6a - 4a) + (5b - 8b + 3b) + (-6ab - ab + 2ab)$

$= -2a - 5ab$

(iii) The sum of the given expressions

$= (2x^3 - 5x^3 - x^3) + (-3x^2 + 2x^2 + 5x^2) + (7x - 4x - 6x) + (-8 + 1 + 3)$

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

(iv) The sum of the given expressions

$= (2x^2 + 3x^2 - x^2) + (-8xy + 6xy - xy) + (7y^2 - y^2 + 4y^2) + (-8xy^2 + 2xy^2 + xy^2)$

$= 4x^2 - 3xy + 10\ y^2 - 5xy^2$

(v) The sum of the given expressions

$= (x^3 - x^3 + x^3) + (y^3 + y^3 - y^3) + (-z^3 + z^3 - z^3) + (3xyz - 6xyz - 8xyz)$

$= x^3 + y^3 - z^3 - 11xyz$

(vi) The sum of the given expressions

$= (2 - 6 + 2 + 3) + (x - 2x + 4x) + (-x^2 + 4x^2 + x^2 - 2x^2) + (6x^3 - 3x^3 - x^3)$

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

4.

Solutions

(i) Changing the sign of each term of expression to be subtracted and add it to the expression from which subtraction is to be made

We get

Term which is subtracted = 5x

Changing the sign of each term of expression = -5x

$2x - 5x = (2 - 5)\ x$

$= -3x$

(ii) Changing the sign of each term of expression to be subtracted and add it to the expression from which subtraction is to be made

We get

Term which is subtracted = -xy

Changing the sign of each term of expression = xy

$6xy + xy = (6 + 1)\ xy$

$= 7xy$

(iii) Changing the sign of each term of expression to be subtracted and add it to the expression from which subtraction is to be made

We get

Term which is subtracted = 3a

Changing the sign of each term of expression = – 3a

= (5b – 3a)

(iv) Changing the sign of each term of expression to be subtracted and add it to the expression from which subtraction is to be made

We get

Term which is subtracted = – 7x

Changing the sign of each term of expression = 7x

= (9y + 7x)

(v) Changing the sign of each term of expression to be subtracted and add it to the expression from which subtraction is to be made

We get

Term which is subtracted = $10x^2$

Changing the sign of each term of expression = $– 10x^2$

$= (- 7x^2 – 10x^2)$

$= – 17x^2$

(vi) Changing the sign of each term of expression to be subtracted and add it to the expression from which subtraction is to be made

We get

Term which is subtracted = $a^2 – b^2$

Changing the sign of each term of expression = $– (a^2 – b^2)$

$= (b^2 – a^2) – (a^2 – b^2)$

$= (b^2 – a^2 – a^2 + b^2)$

$= 2b^2 – 2a^2$

5.

Solutions

(i) Changing the sign of each term of expression to be subtracted and add it to the expression from which subtraction is to be made

Term which is subtracted = 5a + 7b – 2c

Changing the sign of each term of expression = – 5a – 7b + 2c

Now add

= (3a – 7b + 4c) + (- 5a – 7b + 2c)

= 3a – 5a – 7b – 7b + 4c + 2c

= -2a – 14b + 6c

(ii) Changing the sign of each term of expression to be subtracted and add it to the expression from which subtraction is to be made

Term which is subtracted = a – 2b – 3c

Changing the sign of each term of expression = -a + 2b + 3c

Now add

= (- 2a + 5b – 4c) + (-a + 2b + 3c)

= -2a + 5b – 4c – a + 2b + 3c

= -3a + 7b – c

(iii) Changing the sign of each term of expression to be subtracted and add it to the expression from which subtraction is to be made

Term which is subtracted = $5x^2 – 3xy + y^2$

Changing the sign of each term of expression = $– 5x^2 + 3xy – y^2$

Now add

= $(7x^2 – 2xy – 4y^2) + (- 5x^2 + 3xy – y^2)$

= $7x^2 – 2xy – 4y^2 – 5x^2 + 3xy – y^2$

= $2x^2 + xy – 5y^2$

(iv) Changing the sign of each term of expression to be subtracted and add it to the expression from which subtraction is to be made

Term which is subtracted = $6x^3 – 7x^2 + 5x – 3$

Changing the sign of each term of expression = $-6x^3 + 7x^2 – 5x + 3$

Now add

= $(4 – 5x + 6x^2 – 8x^3) + (- 6x^3 + 7x^2 – 5x + 3)$

= $4 – 5x + 6x^2 – 8x^3 – 6x^3 + 7x^2 – 5x + 3$

= $4 + 3 – 5x – 5x + 6x^2 + 7x^2 – 8x^3 – 6x^3$

= $7 – 10x + 13x^2 – 14x^3$

(v) Changing the sign of each term of expression to be subtracted and add it to the expression from which subtraction is to be made

Term which is subtracted = $x^3 + 2x^2y + 6xy^2 – y^3$

Changing the sign of each term of expression = $-x^3 – 2x^2y – 6xy^2 + y^3$

Now add

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

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

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

$= 2y^3 - 9xy^2 - 6x^2y - x^3$

(vi) Changing the sign of each term of expression to be subtracted and add it to the expression from which subtraction is to be made

Term which is subtracted = $-11x^2y^2 + 7xy - 6$

Changing the sign of each term of expression = $11x^2y^2 - 7xy + 6$

Now add

$= (9x^2y^2 - 6xy + 9) + (11x^2y^2 - 7xy + 6)$

$= 9x^2y^2 - 6xy + 9 + 11x^2y^2 - 7xy + 6$

$= 9x^2y^2 + 11x^2y^2 - 6xy - 7xy + 9 + 6$

$= 20x^2y^2 - 13xy + 15$

(vii) Changing the sign of each term of expression to be subtracted and add it to the expression from which subtraction is to be made

Term which is subtracted = $-2a + b + 6d$

Changing the sign of each term of expression = $2a - b - 6d$

Now add

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

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

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

$= 7a - 3b - 3c - 6d$

6.

Solution

(i) Given

$2p^3 - 3p^2 + 4p - 5 - 6p^3 + 2p^2 - 8p - 2 + 6p + 8$

Rearranging and collecting the like terms, we get:

$= 2p^3 - 6p^3 - 3p^2 + 2p^2 + 4p - 8p + 6p - 5 + 2 + 8$

$= (2 - 6)\, p^3 - (3 - 2)\, p^2 + (4 - 8 + 6)\, p - (5 - 2 - 8)$

$= (- 4)\, p^3 - (1)\, p^2 + (10 - 8)\, p - (5 - 10)$

$= (-4)\, p^3 - p^2 + (2)\, p - (-5)$

$= -4p^3 - p^2 + 2p + 5$

(ii) Given

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

Rearranging and collecting the like terms, we get:

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

$= (2 + 6)\, x^2 - (1 - 5)\, xy + (6 - 4)\, x - (4 - 3)\, y$

$= (8)\, x^2 - (-4)\, xy + (2)\, x - (1)\, y$

$= 8x^2 + 4xy + 2x - y$

(iii) Given

$x^4 - 6x^3 + 2x - 7 + 7x^3 - x + 5x^2 + 2 - x^4$

Rearranging and collecting the like terms, we get:

$= x^4 - x^4 - 6x^3 + 7x^3 + 5x^2 + 2x - x - 7 + 2$

$= (1 - 1)\, x^4 - (6 - 7)\, x^3 + 5x^2 + (2 - 1)\, x - 7 + 2$

$= -(-1)\, x^3 + 5x^2 + (1)\, x - 7 + 2$

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

7.

Solution

To find the sum

Add $3x^2 - 5x + 2$ and $-5x^2 - 8x + 6$

$(3x^2 - 5x + 2) + (-5x^2 - 8x + 6)$

Rearranging and collecting the like terms, we get:

$= 3x^2 - 5x^2 - 5x - 8x + 2 + 6$

$= (3 - 5)\, x^2 - (5 + 8)\, x + 2 + 6$

$= -2x^2 - 13x + 8$

Now Subtract $4x^2 - 9x + 7$ from $-2x^2 - 13x + 8$

Changing the sign of each term of expression to be subtracted and add it to the expression from which subtraction is to be made

Term which is subtracted $= 4x^2 - 9x + 7$

Changing the sign of each term of expression $= -4x^2 + 9x - 7$

$= -2x^2 - 13x + 8 - 4x^2 + 9x - 7$

$= -2x^2 - 13x + 8 - 4x^2 - 9x - 7$

$= -2x^2 - 4x^2 - 13x - 9x + 8 - 7$

$= (-2 - 4)\, x^2 - (13 + 9)\, x + 8 - 7$

$= -6x^2 - 4x + 1$

8.

Solution

Given

$A = 7x^2 + 5xy - 9y^2$

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

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

To show A + B + C = 0

Substitute the value of A, B and C in A + B + C

$A + B + C = (7x^2 + 5xy - 9y^2) + (-4x^2 + xy + 5y^2) + (4y^2 - 3x^2 - 6xy)$

$= 7x^2 + 5xy - 9y^2 - 4x^2 + xy + 5y^2 + 4y^2 - 3x^2 - 6xy$

Rearranging and collecting the like terms, we get:

$= 7x^2 - 4x^2 - 3x^2 + 5xy + xy - 6xy - 9y^2 + 5y^2 + 4y^2$

$= (7 - 4 - 3)\, x^2 + (5 + 1 - 6)\, xy - (9 - 5 - 4)\, y^2$

$= 0\, x^2 + 0\, xy - 0\, y^2$

$= 0 + 0 + 0$

$= 0$

Hence,

$A + B + C = 0$

9.

Solution

Let X be the expression to be added to $5x^3 - 2x^2 + 6x + 7$

$(5x^3 - 2x^2 + 6x + 7) + X = x^3 + 3x^2 - x + 1$

$X = (x^3 + 3x^2 - x + 1) - (5x^3 - 2x^2 + 6x + 7)$

Changing the sign of each term of expression to be subtracted and add it to the expression from which subtraction is to be made

Term which is subtracted $= 5x^3 - 2x^2 + 6x + 7$

Changing the sign of each term of expression $= -5x^3 + 2x^2 - 6x - 7$

$X = (x^3 + 3x^2 - x + 1) + (-5x^3 + 2x^2 - 6x - 7)$

$= x^3 + 3x^2 - x + 1 - 5x^3 + 2x^2 - 6x - 7$

Rearranging and collecting the like terms, we get:

$= x^3 - 5x^3 + 3x^2 + 2x^2 - x - 6x + 1 - 7$

$= (1 - 5)\, x^3 + (3 + 2)\, x^2 - (1 + 6)\, x + 1 - 7$

$= -4x^3 + 5x^2 + 7x - 6$

$\therefore -4x^3 + 5x^2 + 7x - 6$ must be added to $5x^3 - 2x^2 + 6x + 7$ to make the sum $x^3 + 3x^2 - x + 1$

RS Aggarwal Solutions for Class 6 Maths Chapter 8 – Algebraic Expressions

Exercise 8D

PAGE NO: 136

Simplify:

1.

Solution

Here, (-) sign precedes the second parenthesis, so we remove it and change the sign of each term within

$\therefore a - (b - 2a)$

$= a - (b - 2a)$

$= a - b + 2a$

$= 3a - b$

2.

Solution

Here, (-) sign precedes the second parenthesis, so we remove it and change the sign of each term within

$\therefore 4x - (3y - x + 2z)$

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

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

$= 5x - 3y - 2z$

3.

Solution

Here, (-) sign precedes the second parenthesis, so we remove it and change the sign of each term within

$\therefore (a^2 + b^2 + 2ab) - (a^2 + b^2 - 2ab)$

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

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

$= 4ab$

4.

Solution

Here, (-) sign precedes the first and third parenthesis, so we remove it and change the sign of each term within

$\therefore -3(a + b) + 4(2a - 3b) - (2a - b)$

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

$= -3a - 3b + 8a - 12b - 2a + b$

$= -3a + 8a - 2a - 3b - 12b + b$

$= 8a - 5a - 15b + b$

= 3a -14b

5.

Solution

We first remove the innermost grouping symbol ( ) and then { },

We have:

$-4x^2 + \{(2x^2 - 3) - (4 - 3x^2)\}$

$= -4x^2 + \{2x^2 - 3 - 4 + 3x^2\}$

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

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

$= -4x^2 + 5x^2 - 7$

$= x^2 - 7$

6.

Solution

Here, (-) sign precedes both the parenthesis, so we remove it and change the sign of each term within

$\therefore -2(x^2 - y^2 + xy) - 3(x^2 + y^2 - xy)$

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

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

$= (-2 - 3)\, x^2 + (2 - 3)\, y^2 + (-2 + 3)\, xy$

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

7.

Solution

We first remove the innermost grouping symbol ( ), { } and [ ]

We have,

$a - [2b - \{3a - (2b - 3c)\}]$

$= a - [2b - \{3a - 2b + 3c\}]$

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

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

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

$= 4a - 4b + 3c$

8.

Solution

We first remove the innermost grouping symbol ( ), { } and [ ]

We have

$- x + [5y - \{x - (5y - 2x)\}]$

$= - x + [5y - \{x - 5y + 2x\}]$

$= - x + [5y - x + 5y - 2x]$

$= - x + 5y - x + 5y - 2x$

$= - x - x - 2x + 5y + 5y$

$= (-1 -1 -2) x + (5 + 5) y$

$= - 4x + 10y$

9.

Solution

We first remove the innermost grouping symbol ( ), { } and [ ]

We have

$86 - [15x - 7(6x - 9) - 2\{10x - 5(2 - 3x)\}]$

$= 86 - [15x - 42x + 63 - 2\{10x - 10 + 15x\}]$

$= 86 - [15x - 42x + 63 - 20x + 20 - 30x]$

$= 86 - 15x + 42x - 63 + 20x - 20 + 30x$

$= 86 - 63 - 20 - 15x + 42x + 20x + 30x$

$= 3 + 77x$