ODM EDUCATIONAL GROUP
Changing your Tomorrow

FUNDAMENTAL OPERATIONS

SUBJECT : MATHEMATICS
CHAPTER NUMBER:19
CHAPTER NAME :FUNDAMENTAL OPERATIONS
SUBTOPIC : Basic Concepts, Addition and Subtraction of Like Terms and Unlike Terms
PERIOD NO: 1

Website: www.odmegroup.org
Email: info@odmps.org
Toll Free: 1800 120 2316
Sishu Vihar, Infocity Road, Patia, Bhubaneswar- 751024

Learning outcomes

- Students will be able to identify like and unlike terms.
- Students will be able to add and subtract like and unlike terms.

FUNDAMENTAL OPERATIONS

Like and unlike terms will be explained with the help of a video.
https://www.youtube.com/watch?v=F14ramrPMDg(5.36)

Lesson 1 – Introduction to Polynomials

Like Terms: Terms that have the same variable AND the same exponent.

Example: $3y^2, y^2, -\frac{2}{3}y^2$ *are like terms*

Unlike Terms: Terms that have the different variables OR different exponents

Example: $3y^2, 2y, -3x$ *are unlike terms*

FUNDAMENTAL OPERATIONS

Like Terms	Unlike Terms	Why are they Unlike Terms?
$2x + 19x$	$2x + 19a$	The variables are different.
$4w - 10w$	$4w - 10w^2$	The exponents are different.
$14.2r - 12r$	$12r - 12s$	The variables are different.
$32a^2 + 9a^2$	$32a^2 + 9a^3$	The exponents are different.
$8y + 5y$	$8y + 5$	One term is a constant and the other has a variable.

UDM EDUCATIONAL GROUP
Changing your Tomorrow

Evaluation Question EX-19 A

1. Fill in the blanks:

(i) 5 + 4 = …….. and 5x + 4x = ……

(ii) 12 + 18 = ……. and $12x^2y + 18x^2y$ = ……..

(iii) 7 + 16 = …….. and 7a + 16b = …….

(iv) 1 + 3 = ……. and $x^2y + 3xy^2$ = ……

(v) 7 – 4 = …… and 7ab – 4ab = ……

Solution:

(i) 5 + 4 = **9** and 5x + 4x = **9x**

(ii) 12 + 18 = **30** and $12x^2y + 18x^2y$ = **$30x^2y$**

(iii) 7 + 16 = **23** and 7a + 16b = **7a + 16b**

ODM EDUCATIONAL GROUP
Changing your Tomorrow

Evaluation Question EX-19 A

Solution:

(iv) 1 + 3 = **4** and $x^2y + 3xy^2$ = $\mathbf{x^2y + 3xy^2}$

(v) 7 – 4 = **3** and 7ab – 4ab = **3ab**

2. Fill in the blanks:

(i) The sum of -2 and -5 = …… and the sum of -2x and -5x = …….

(ii) The sum of 8 and -3 = …… and the sum of 8ab and -3ab = ……..

(iii) The sum of -15 and -4 = …… and the sum of -15x and -4y = …….

(iv) 15 + 8 + 3 = …….. and 15x + 8y + 3x = ……..

(v) 12 – 9 + 15 = …….. and 12ab – 9ab + 15ba = …….

Evaluation Question EX-19 A

Solution:

(i) The sum of -2 and -5 = **– 7** and the sum of -2x and -5x = **– 7x**

(ii) The sum of 8 and -3 = **5** and the sum of 8ab and -3ab = **5ab**

(iii) The sum of -15 and -4 = **– 19** and the sum of -15x and -4y = **– 15x – 4y**

(iv) 15 + 8 + 3 = **26** and 15x + 8y + 3x = **18x + 8y**

(v) 12 – 9 + 15 = **18** and 12ab – 9ab + 15ba = **18ab**

3. Add:

(i) 8xy and 3xy

(ii) 2xyz, xyz and 6xyz

(iii) 2a, 3a and 4b

Evaluation Question EX-19 A

3. Add:

(iv) 3x and 2y

(v) 5m, 3n and 4p

Solution:

(i) 8xy and 3xy

The addition of 8xy and 3xy is calculated as follows

$8xy + 3xy = 11xy$

(ii) 2xyz, xyz and 6xyz

The addition of 2xyz, xyz and 6xyz is calculated as follows

$2xyz + xyz + 6xyz = 9xyz$

Evaluation Question EX-19 A

Solution:

(iii) 2a, 3a and 4b

The addition of 2a, 3a and 4b is calculated as follows

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

(iv) 3x and 2y

The addition of 3x and 2y is calculated as follows

$3x + 2y = 3x + 2y$

(v) 5m, 3n and 4p

The addition of 5m, 3n and 4p is calculated as follows

$5m + 3n + 4p = 5m + 3n + 4p$

Evaluation Question EX-19 A

4. Evaluate:

(i) 6a – a – 5a – 2a

(ii) 2b – 3b – b + 4b

(iii) 3x – 2x – 4x + 7x

(iv) 5ab + 2ab – 6ab + ab

(v) 8x – 5y – 3x + 10y

Solution:

(i) The value of given expression is calculated as below

6a – a – 5a – 2a = (6 – 1 – 5 – 2) a

We get, = (5 – 5 – 2) a = – 2a

Therefore, 6a – a – 5a – 2a = – 2a

Evaluation Question EX-19 A

Solution:

(ii) $2b - 3b - b + 4b$

The value of given expression is calculated as below

$2b - 3b - b + 4b = 2b + 4b - (3 + 1)\, b$

We get,$= 6b - 4b = 2b$

Therefore, $2b - 3b - b + 4b = 2b$

(iii) $3x - 2x - 4x + 7x$

The given expression is calculated as below

$3x - 2x - 4x + 7x = 3x + 7x - 2x - 4x = (3 + 7)\, x - (2 + 4)\, x$

$= 10x - 6x = 4x$

Therefore, $3x - 2x - 4x + 7x = 4x$

Evaluation Question EX-19 A

Solution:

(iv) $5ab + 2ab – 6ab + ab$

The given expression is calculated as below

$5ab + 2ab – 6ab + ab = 5ab + 2ab + ab – 6ab$

We get, $= 8ab – 6ab = 2ab$

Therefore, $5ab + 2ab – 6ab + ab = 2ab$

(v) $8x – 5y – 3x + 10y$

The given expression is calculated as below

$8x – 5y – 3x + 10y = 8x – 3x + 10y – 5y = 5x + 5y$

Therefore, $8x – 5y – 3x + 10y = 5x + 5y$

Evaluation Question EX-19 A

5. Evaluate:

(i) -7x + 9x + 2x – 2x

(ii) 5ab – 2ab – 8ab + 6ab

(iii) -8a – 3a + 12a + 13a – 6a

(iv) 19abc – 11abc – 12abc + 14abc

Solution:

(i) -7x + 9x + 2x – 2x

The value of given expression is calculated as follows

-7x + 9x + 2x – 2x = 9x + 2x – 7x – 2x = 11x – 9x

We get, = 2x

Hence, -7x + 9x + 2x – 2x = 2x

Evaluation Question EX-19 A

Solution:

(ii) 5ab – 2ab – 8ab + 6ab

The value of given expression is calculated as follows

5ab – 2ab – 8ab + 6ab = 5ab + 6ab – 2ab – 8ab

We get, = 11ab – 10ab = ab

Hence, 5ab – 2ab – 8ab + 6ab = ab

(iii) –8a – 3a + 12a + 13a – 6a

The value of given expression is calculated as follows

-8a – 3a + 12a + 13a – 6a = 12a + 13a – (8a + 3a + 6a)

= 25a – 17a = 8a

Hence, -8a – 3a + 12a + 13a – 6a = 8a

Evaluation Question EX-19 A

Solution:

(iv) 19abc – 11abc – 12abc + 14abc

The value of given expression is calculated as follows

19abc – 11abc – 12abc + 14abc = abc (19 – 11 – 12 + 14)

= abc (33 – 23) = 10abc

Hence, 19abc – 11abc – 12abc + 14abc = 10abc

6. Subtract the first term from the second:

(i) 4ab, 6ba

(ii) 4.8b, 6.8b

(iii) 3.5abc, 10.5abc

(iv) 3(1 / 2) mn, 8(1 / 2)nm

Evaluation Question EX-19 A

Solution:

(iv) 19abc – 11abc – 12abc + 14abc

The value of given expression is calculated as follows

19abc – 11abc – 12abc + 14abc = abc (19 – 11 – 12 + 14)

= abc (33 – 23) = 10abc

Hence, 19abc – 11abc – 12abc + 14abc = 10abc

6. Subtract the first term from the second:

(i) 4ab, 6ba

(ii) 4.8b, 6.8b

(iii) 3.5abc, 10.5abc

(iv) 3(1 / 2) mn, 8(1 / 2)nm

Evaluation Question EX-19 A

Solution:

(i) 4ab, 6ba

The subtraction of first term from the second term is calculated as below

6ba – 4ab = 2ab

(ii) 4.8b, 6.8b

The subtraction of first term from the second term is calculated as below

6.8b – 4.8b = 2b

(iii) 3.5abc, 10.5abc

The subtraction of first term from the second term is calculated as below

10.5abc – 3.5abc = 7abc

Evaluation Question EX-19 A

Solution: (iv) 3(1 / 2) mn, 8(1 / 2)nm

The subtraction of first term from the second term is calculated as below

8(1 / 2)nm – 3 (1 / 2) mn = (17 / 2)nm – (7 / 2)mn

We get, = [(17mn – 7mn) / 2]

= (10 / 2)mn = 5mn

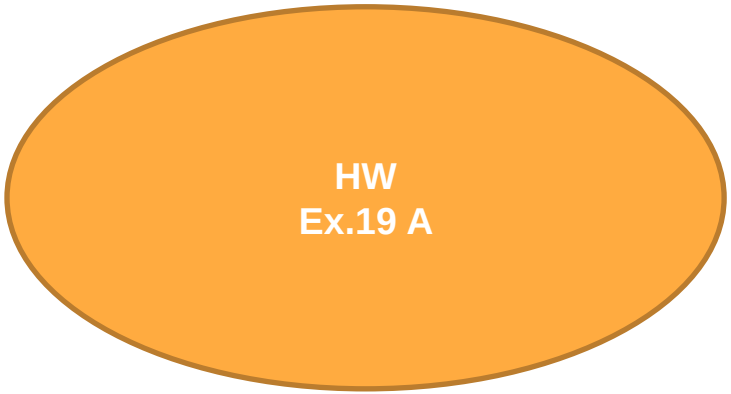
Additional Homework

1. State whether true or false:

(i) xy and −yx are like terms.

(ii) x^2y and $-y^2x$ are like terms.

(iii) a and −a are like terms.



ODM EDUCATIONAL GROUP
Changing your Tomorrow

THANKING YOU

ODM EDUCATIONAL GROUP

ODM EDUCATIONAL GROUP
Changing your Tomorrow