

Algebraic Expressions

Question 1.

Find the value of $a^2 + b^2$ if $a = 2$ and $b = -2$.

- (a) 0
- (b) 8
- (c) 4
- (d) None of these

Answer: (b) 8

$$2^2 + (-2)^2 = 4 + 4 = 8.$$

Question 2.

Write an expression : Raju's father's age is 5 years more than 3 times Raju's age. If Raju's age is x years, then father's age is

- (a) $3x - 5$
- (b) $3x + 7$
- (c) $5 - 3x$
- (d) $3x + 5$

Answer: (d) $3x + 5$

Question 3.

Subtract $-5y^2$ from y^2 .

- (a) $-4y^2$
- (b) $4y^2$
- (c) $6y^2$
- (d) None of these

Answer: (c) $6y^2$

$$y^2 - (-5y^2) = y^2 + 5y^2 = 6y^2.$$

Question 4.

A _____ can take various values.

- (a) variable
- (b) expression
- (c) term
- (d) None of these

Answer: (a) variable

Question 5.

The simplified form of the Boolean expression $(X + Y + XY)(X + Z)$ is

- (a) $X + Y + Z$
- (b) $XY + YZ$
- (c) $X + YZ$
- (d) $XZ + Y$

Answer: (c) $X + YZ$

Question 6.

Identify terms which contain x in following expression $13y^2 - 8yx$

- (a) $-8yx$
- (b) $13y^2$
- (c) $-8y$
- (d) None of these

Answer: (a) $-8yx$

Here, x is in the term $-8yx$.

Question 7.

For what value of 'm' is $9 - 5m = (-1)$?

- (a) -1
- (b) -2
- (c) 2
- (d) 1

Answer: (c) 2

Question 8.

The number z is multiplied by itself, write its algebraic expression.

- (a) $2z$
- (b) z^2
- (c) $2z$
- (d) None of these

Answer: (b) z^2

Product of z with z is z^2 .

Question 9.

What is the difference between $3a + 2b$ and $-2a - 5b$?

- (a) $5a + 7b$
- (b) $-5a - 7b$
- (c) $5a - 7b$
- (d) $a - 3b$

Answer: (a) $5a + 7b$

Question 10.

Add 3 mn, -5 mn, 8 mn, -4mn.

- (a) 2 mn
- (b) 20 mn
- (c) -2 mn
- (d) None of these

Answer: (a) 2 mn

3 mn and 8 mn are positive so sum of -5 mn and -4mn is subtracted from sum of 3 mn and 8 mn.

Question 11.

Identify, in the following expressions, terms which are not constants : $xy + 4$.

- (a) xy
- (b) 4
- (c) x
- (d) y

Answer: (a) xy

Values of xy are variable. Therefore these are not constant.

Question 12.

An expression which contains two unlike terms is called _____.

- (a) binomial
- (b) monomial
- (c) trinomial
- (d) None of these

Answer: (a) binomial

Question 13.

Get the algebraic expression of subtraction of z from y.

- (a) $z - y$
- (b) $y - z$
- (c) $-z + y$
- (d) None of these

Answer: (b) $y - z$

z is subtracted from y.

Question 14.

A and B are polynomials and each is the additive inverse of the other. What does it mean?

- (a) $A = B$
- (b) $A+B$ is a zero polynomial.
- (c) $A-B$ is a zero polynomial.
- (d) $A-B = B-A$

Answer: (b) $A+B$ is a zero polynomial.

Question 15.

Find the value of $7a - 4b$ if $a = 3$, $b = 2$.

- (a) 17
- (b) 29
- (c) 13
- (d) None of these

Answer: (c) 13

$$7 \times 3 - 4 \times 2 = 21 - 8 = 13.$$

Question 16.

Get the algebraic expressions for subtraction of z from y .

- (a) $y \times z$
- (b) $y - z$
- (c) $y + z$
- (d) $\frac{y}{z}$

Answer: (b) $y - z$

Question 17.

What is the co-efficient of y in the given algebraic expression $8 + yz$.

- (a) 8
- (b) 1
- (c) z
- (d) None of these

Answer: (c) z

As term with factor y is yz . Therefore, co-efficient of z is co-efficient of y .

Question 18.

What are the coefficients of y in the expression $4x - 3y$?

- (a) -4
- (b) -3
- (c) 3
- (d) 4

Answer: (b) -3

Question 19.

Write the term which contains y^2 in expression $5y^2 + 7x$.

- (a) 5
- (b) $5y^2$
- (c) 7
- (d) None of these

Answer: (b) $5y^2$

y^2 is with constant 5.

Question 20.

Simplify these expressions and find their values, if $x = 3$, $a = -1$, $b = -2$.

$$3x - 5a - x^2 + 9b$$

- (a) -13
- (b) 15
- (c) 13
- (d) None of these

Answer: (a) -13

Question 21.

Identify the co-efficient of x in the given expression : $4x - 3y$.

- (a) 4
- (b) -3
- (c) $4x$
- (d) None of these

Answer: (a) 4

As term with factor x is $4x$ therefore, co-efficient of x is 4.

Question 22.

The sum of $mn + 5 - 2$ and $mn + 3$ is

- (a) $2mn + 6$
- (b) $mn + 6$
- (c) $2mn - 6$
- (d) $mn - 6$

Answer: (a) $2mn + 6$

Question 23.

Find the value of $x + 4$ at $x = 2$.

- (a) 2
- (b) 6
- (c) 4
- (d) None of these

Answer: (b) 6

As $x = 2 \therefore$ Given expression becomes $2 + 4 = 6$.

Question 24.

What are the coefficients of y in the expression $yz^2 + 5$?

- (a) z
- (b) z^2
- (c) 1
- (d) 5

Answer: (b) z^2

Question 25.

Write the numerical co-efficients of $100m + 1000n$.

- (a) 100, 1000
- (b) 100
- (c) 1000
- (d) None of these

Answer: (a) 100, 1000

Both terms have variable so numerical co-efficients are 100,1000.

Question 26.

Simplify combining like terms: $3a - 2b - ab - (a - b + ab) + 3ab + b - a$

- (a) $a - ab$
- (b) $a + ab$
- (c) $a + b$
- (d) None of these

Answer: (b) $a + ab$

Question 27.

Numbers x and y when both squared and added, write it in algebraic expression.

- (a) $2x + 2y$
- (b) $x + y$
- (c) $x^2 + y^2$
- (d) None of these

Answer: (c) $x^2 + y^2$

Square of x and square of y are x^2 and y^2 . Sum is $x^2 + y^2$.

Question 28.

The length and breadth of a rectangular plot are l and b . Two rectangular paths each of width w run inside the plot one parallel to the length and the other parallel to the breadth. What is the total area of the paths?

- (a) $(l + w)(b + w) - lb$
- (b) $lb - (l - w)(b - w)$
- (c) $(l + b - w)w$
- (d) $lb - (l - 2w)(b - 2w)$

Answer: (c) $(l + b - w)w$

Question 29.

In the above identify numerical co-efficient of variables.

- (a) 4
- (b) y
- (c) 1
- (d) None of these

Answer: (c) 1

If there is not any co-efficient with variables then 1 is always numerical co-efficient of variables.

Question 30.

Find the value of $x + 4$ for $x = 2$.

- (a) 6
- (b) 8
- (c) 4
- (d) None of these

Answer: (a) 6

Question 31.

Identify terms in the expression $x - 3$.

- (a) x , -3
- (b) x , 3
- (c) 1 , -3
- (d) None of these

Answer: (a) x , -3

x , -3 are terms of given expression.

Question 32.

In a two digit number, the units digit is x and tens digit is $(x+3)$. What is the sum of the digits in the number?

- (a) $11x+3$
- (b) $2x+3$
- (c) $3+x$
- (d) $11x+30$

Answer: (b) $2x+3$

Question 33.

Write algebraic expression of one half of the sum of numbers x and y .

- (a) $\frac{1}{2}(x + y)$
- (b) $\frac{x}{2} + y$
- (c) $x + \frac{y}{2}$
- (d) None of these

Answer: (a) $\frac{1}{2}(x + y)$

Sum of x and y is divided by 2.

Question 34.

The constant term in the expression $1 + x^2 + x$ is

- (a) 1
- (b) x
- (c) x^2
- (d) None of these

Answer: (a) 1

Question 35.

When a certain number, 'm' is divided by 5 and added to 8, the result is equal to thrice the number subtracted from 4. What is the value of 'm'?

- (a) 2
- (b) $\frac{4}{3}$
- (c) -1
- (d) $\frac{30}{7}$

Answer: (d) $\frac{30}{7}$

State whether the given statements are True or False.

Question 1.

A variable can take various values.

Answer: True

Question 2.

An expression with only one term is called a monomial.

Answer: True

Question 3.

A constant does not have a fixed value.

Answer: False

Question 4.

Terms $2xy$ and 4 are like terms.

Answer: False

Complete the following table :

S.No.	Expression	Terms with factor x	Co-efficient of x
(i)	$4x - 3y$	$4x$	_____
(ii)	$8 - x + y$	$-x$	_____
(iii)	$y^2x - y$	y^2x	_____
(iv)	$2z - 5xz$	$-5xz$	_____

Answer:

(i) 4

- (ii) -1
(iii) y^2
(iv) $-5z$
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Match the following :

1. $7x, 12y$	(a) Like terms
2. $15x, -21x$	(b) Unlike terms
3. $-4ab, 7ba$	(c) Unlike terms
4. $6y^2, 9x^2y$	(d) Like terms

Answer:

1. $7x, 12y$	(c) Unlike terms
2. $15x, -21x$	(a) Like terms
3. $-4ab, 7ba$	(d) Like terms
4. $6y^2, 9x^2y$	(b) Unlike terms

Match the following :

1. $4y - 7z$	(a) Monomial
2. y^2	(b) Monomial
3. $x + y - xy$	(c) Binomial
4. 100	(d) Trinomial

Answer:

1. $4y - 7z$	(c) Binomial
2. y^2	(a) Monomial
3. $x + y - xy$	(d) Trinomial
4. 100	(b) Monomial

Complete the following table :

S.No.	Expression	Term which is not a constant
(i)	$xy + 4$	_____
(ii)	$13 - y^2$	_____
(iii)	$13 - y + 5y^2$	_____
(iv)	$4p^2q - 3pq^2 + 5$	_____

Answer:

(i) xy

(ii) $-y^2$

(iii) $-y, 5y^2$

(iv) $4p^2q, -3pq^2$

Identify like terms in the following :

$-xy^2, -4yx^2, 8x^2, 2xy^2, 7y, -11x^2,$
 $-100x, -11yx, 20x^2y, -6x^2, y, 2xy, 3x.$

Answer:

$(-xy^2, 2xy^2); (-4yx^2, 20x^2y)$

$(8x^2, -11x^2, -6x^2), (7y, y)$

$(-100x, 3x) (-11xy, 2xy)$

State whether a given pair of terms is of like or unlike terms.

Question 1.

1, 100

Answer: like

Question 2.

$-7x, \frac{5}{2}x$

Answer: like

Question 3.

$-29x, -29y$

Answer: unlike

Question 4.

$14xy, 42yx$

Answer: like

Question 5.

$$4m^2p, 4mp^2$$

Answer: unlike

Question 6.

$$12x^2, 12x^2y^2$$

Answer: unlike

Classify into monomials, binomials and trinomials.

Question 1.

$$4y - 7z$$

Answer: Binomial

Question 2.

$$y^2$$

Answer: Monomial

Question 3.

$$x + y - xy$$

Answer: Trinomial

Question 4.

$$ab - a - b$$

Answer: Trinomial

Question 5.

$$z^2 - 3z + 8$$

Answer: Trinomial

Question 6.

$$z^2 + z$$

Answer: Binomial

Use the given algebraic expression to complete the table of number patterns.

S.No.	Expression	1st	2nd	3rd	4th
(i)	$2n - 1$				
(ii)	$3n + 2$				
(iii)	$4n + 1$				
(iv)	$7n + 20$				

Answer:

(i) 1, 3, 5, 7

(ii) 2, 5, 8, 11

(iii) 5, 9, 13, 17

(iv) 27, 34, 41, 48

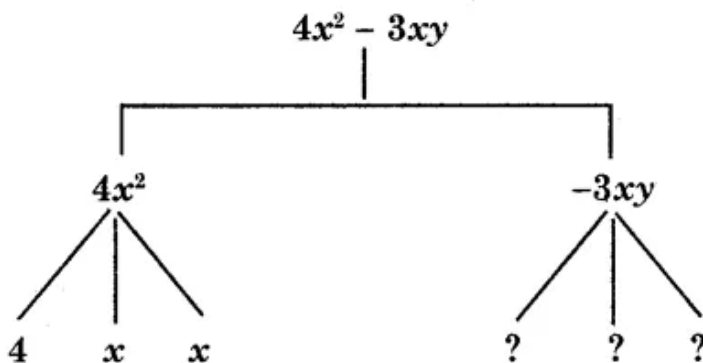
Match the following for $a = 3$, $b = 2$:

1. $a + b$	(a) 13
2. $7a - 4b$	(b) 1
3. $a^2 + 2ab + b^2$	(c) 5
4. $a^2 - b^3$	(d) 25

Answer:

1. $a + b$	(c) 5
2. $7a - 4b$	(a) 13
3. $a^2 + 2ab + b^2$	(d) 25
4. $a^2 - b^3$	(b) 1

Complete the tree diagram.



Answer:

-3, x, y.

Fill in the blanks.

1. The terms having the same literal factors are called terms.

Answer: like

2. An expression with only one term is called a

Answer: monomial

3. A statement of equality involving one or more variables is called an

Answer: equation

4. A symbol having a fixed numerical value is called a

Answer: constant

5. A symbol which takes various numerical values is called a

Answer: variable

6. An expression which contains two terms is called a

Answer: binomial

7. An expression with one or more terms is called a

Answer: polynomial

8. A combination of constants and variables connected by the signs of basic operations of +, -, $\times$ and $\div$ is called an expression.

Answer: algebraic

9. The terms not having the same literal factors are called terms.

Answer: unlike

10. An expression which contains three terms is called a

Answer: trinomial
