



# MATHS

# **BOOKS - SWAN PUBLICATION**

# ALGEBRAIC EXPRESSIONS

### Exercise 12 1

1. Generate algebraic expressions for the following

The sum of a and b

2. Generate algebraic expressions for the following

The number z multiplied by itself



The product of x and y added to the product of m and n



4. Generate algebraic expressions for the following

The quotient of p by 5 is multiplied by q.



5. Generate algebraic expressions for the following

One half of z added to twice the number t.



7. Generate algebraic expressions for the following

Sum of the numbers x and z is subtracted from their product.

8. Separate constant terms and variable terms from the

following. 7, 
$$xy$$
,  $\frac{3x^2}{2}$ ,  $\frac{72z}{3}$ ,  $\frac{-8z}{3x^2}$ 

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9. Write the terms and factors for each of the following

algebraic expression

 $2x^2 + 3yz$ 

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10. Write the terms and factors for each of the following

algebraic expression



algebraic expression

 $-7xyz^2$ 

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12. Write the terms and factors for each of the following

algebraic expression

 $100pq + 10p^2q^2$ 

13. Write the terms and factors for each of the following

algebraic expression

 $xy + 3x^2y^2$ 

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14. Write the terms and factors for each of the following

algebraic expression

$$-7x^2yz+3xy^2z+2xyz^2$$

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**15.** Classify the following algebraic expression into monomial, binomial and trinomial



**17.** Classify the following algebraic expression into monomial, binomial and trinomial

$$ax + by^2 + cz^2$$

**18.** Classify the following algebraic expression into monomial, binomial and trinomial  $3x^2y^2$ 

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**19.** Classify the following algebraic expression into monomial, binomial and trinomial

1 + x



**20.** Classify the following algebraic expression into monomial, binomial and trinomial



**21.** Classify the following algebraic expression into monomial, binomial and trinomial

$$\frac{3}{2}p + \frac{7}{6}q$$

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**22.** Write numerical coefficient of each of the following algebraic expression

2x

23. Write numerical coefficient of each of the following

algebraic expression

$$\frac{-3}{2}xyz$$

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24. Write numerical coefficient of each of the following

algebraic expression

$$\frac{7}{2}x^2p$$



25. Write numerical coefficient of each of the following

algebraic expression



26. Write numerical coefficient of each of the following

algebraic expression

 $-5mn^2$ 

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27. State whether the given pairs of terms is of like or

unlike terms

$$-3y,\,rac{7}{8}y$$

**28.** State whether the given pairs of terms is of like or unlike terms

-32, -32x

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29. State whether the given pairs of terms is of like or

unlike terms

 $3x^2y, 3xy^2$ 



30. State whether the given pairs of terms is of like or

unlike terms



31. State whether the given pairs of terms is of like or

unlike terms

 $8pq, 32pq^2$ 

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**32.** State whether the given pairs of terms is of like or unlike terms

10x, 15x

**33.** In the following algebraic expression write the coefficient of

x in  $x^2y$ 

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**34.** In the following algebraic expression write the coefficient of

xyz in  $15x^2yz$ 



**35.** In the following algebraic expression write the coefficient of



coefficient of

 $m^2 \ {
m in} \ m^2 + n^2$ 

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**37.** In the following algebraic expression write the coefficient of

xy in  $x^2y^2+2x+3$ 

38. Identify the terms and their factors in the following

algebraic expressions by tree diagrams

 $12xy + 7x^2$ 

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**39.** Identify the terms and their factors in the following algebraic expressions by tree diagrams

$$p^2q^2+3mn^2-2pqr$$

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**40.** Identify the terms and their factors in the following algebraic expressions by tree diagrams

$$2x^2y^2 + xyz^2 + zy$$

41. Identify the terms and their factors in the following

algebraic expressions by tree diagrams

$$rac{3}{2}x^3+2x^2y^2-7y^3$$

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Exercise 12 1 Multiple Choice Questions

1. An expression with only one terms is called

A. Monomial

**B.** Binomial

C. Trinomial

D. None of these

#### Answer: A

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**2.** The coefficient of x in 8 - x + y is

A. - 1

B. 1

C. 8

D. 0

Answer: A
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<b>3.</b> Which of the following are like terms?
Δ 7χ 10γ
<i>π. / λ</i> , 12 y
B. 15x, 12x
С. Зху, Зх
D. $2y-2yx$
Answer: B
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4. Terms are added to form

A. Expressions

**B.** Variables

C. Constants

**D.** Factors

Answer: A

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### Exercise 12 2 Fill In The Blanks

$$1.5y + 7y = \dots$$

2. 
$$3xy + 2xy = \dots$$
  
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3.  $12a^2 - 7a^2 = \dots$   
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4.  $8mn^2 - 3mn^2 = \dots$ 



Exercise 12 2



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3. Add the following algebraic expressions

 $12p^2q,\, 3p^2q,\,\, -5p^2q$ 

$$3x^2, -8x^2, -5x^2, 13x^2$$



5. Add the following algebraic expressions

x + y and 2x - 3y



6. Add the following algebraic expressions

5a + 7b and 3a - 2b

3m+2n, 7m-8n, 2m-n



 $3xy + 7x^2 - 2y^2$ ,  $2xy + y^2$  and  $2x^2 + y^2$ 



**12.** Simplify the following algebraic expressions by combining like terms

$$3m-2n+5m-3m+8n$$





**14.** Simplify the following algebraic expressions by combining like terms

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



**17.** Subtract the algebraic expressions

a+b from a-b

18. Subtract the algebraic expressions

 $15m + 10n \;\; {
m from} \;\; 2m - 16n$ 



**21.** What should be subtracted from l-2m+5n to get

$$2l - 3m + 4n$$

**22.** What should be added to 
$$3x^2 + 2xy - y^2$$
 to obtain  $x^2 - 7xy + 3y^2$   
**23.** Subtract  $3a^2 + 2b^2 - 8ab + 8$  from the sum of  $a^2 - b^2 + 7ab + 3$  and  $2a^2 + 4b^2 - 18ab + 7$ 

**24.** How much  $x^2 + 3xy + y^2$  is less than  $2x^2 + 5xy - y^2$ 

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**Exercise 12 2 Multiple Choice Questions** 

**1.** The algebraic expression for "Number 5 added to three times the product of numbers m and n" is

A. 5 + 3mn

 $\mathsf{B.3}+5mn$ 

C.(5+3)mn

D. None of these

![](_page_30_Picture_0.jpeg)

- A. 5x + 4
- B. x + 4
- $C.\,5x-18$
- D. None of these

Answer: A

**3.** Subtraction of a + b from 2a + 3b

A. a + 2b

B.-a-2b

C. 3a + 4b

D.a+b

#### **Answer: A**

![](_page_31_Picture_6.jpeg)

![](_page_31_Picture_7.jpeg)

1. Fill in the Table by substituting the values in the given

expressions

Expression	Value of the expression for			
	x = 1	x = -2	x=3	x=10
(i) $3x + 7$ (ii) $x^2 - 2x + 3$ (iii) $8x^3 - 3x^2$ (iv) $-10x^2 + 20x$			•	1

![](_page_32_Picture_1.jpeg)

2. If a=1, b=-2 find the value of given expressions

 $a^2 - b^2$ 

![](_page_32_Picture_4.jpeg)

3. If a=1, b=-2 find the value of given expressions

 $a+2b-b^2$ 

![](_page_32_Picture_7.jpeg)

**4.** If a=1, b=-2 find the value of given expressions $a^2b+2ab^2+5$ 

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5. Simplify the following expressions and find their values

for  $m=1, n=2, p=\ -1$ 

2m+3n-p+7m-2n

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6. Simplify the following expressions and find their values

for 
$$m=1, n=2, p=\ -1$$

3p+n-m+2n

![](_page_34_Picture_0.jpeg)

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8. Simplify the following expressions and find their values

for m=1, n=2, p=-1

3n+2m-5p-3m-2n+p

9. What should be the value of a if the value of  $2a^2 + b^2 = 10$  when b=2?

![](_page_35_Figure_1.jpeg)

11. Observe the patterns of shapes of letters formed from

line segment of equal lengths.

![](_page_35_Figure_4.jpeg)

If n shapes of letters are formed, then write the algebraic expression for the number of line segment required for making these n shapes in each case.

![](_page_36_Picture_1.jpeg)

12. Observe the patterns of shapes of letters formed from

line segment of equal lengths.

![](_page_36_Figure_4.jpeg)

If n shapes of letters are formed, then write the algebraic expression for the number of line segment required for making these n shapes in each case.

![](_page_36_Picture_6.jpeg)

13. Observe the following pattern of squares made using

![](_page_37_Figure_1.jpeg)

If n is taken as the number of dots in each row then find the algebraic expression for number of dots in nth figure. Also find number of dots if.

n=3

![](_page_37_Picture_4.jpeg)

**14.** Observe the following pattern of squares made using dots.

![](_page_38_Figure_0.jpeg)

If n is taken as the number of dots in each row then find the algebraic expression for number of dots in nth figure. Also find number of dots if.

n=7

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15. Observe the following pattern of squares made using

dots.

![](_page_38_Figure_6.jpeg)

If n is taken as the number of dots in each row then find the algebraic expression for number of dots in nth figure. Also find number of dots if.

n=10

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**16.** Observe the pattern of shapes of digits formed from line segment of equal lengths.

![](_page_39_Figure_4.jpeg)

If n shapes of digits are formed then write the algebraic expression for the numbers of line segment required to make n shapes.

![](_page_39_Picture_6.jpeg)

**Exercise 12 3 Multiple Choice Questions** 

**1.** If I is the length of the side of the regular pentagon, perimeter of a regular pentagon is

A. 3l

B. 4l

C. 5l

D. 8l

Answer: C

**2.** The value of the expression 5n-2 when n=2 is

A. 12

 $\mathsf{B.}-12$ 

C. 8

D. 3

#### Answer: C

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**3.** The value of 
$$3x^2 - 5x + 6$$
 when  $x = 1$ 

A. 3

B. 4

C. - 8

D. 14

Answer: B

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**Other Important Questions Multiple Choice Questions** 

1. What is one half of the sum of numbers x and y?

A. 
$$rac{1}{2}x+y$$
  
B.  $rac{1}{2}y+x$   
C.  $rac{1}{2}(x+y)$ 

D. None of these

#### Answer: C

![](_page_43_Figure_1.jpeg)

2. What is the numerical co-efficient of term  $-3pq^2$  in algebraic expression  $4p^2q - 3pq^2 + 5$ ?

- A. 3
- $\mathsf{B.}-3$
- C. 3p
- $\mathsf{D.}-3q^2$

**Answer: B** 

**3.** Identify the terms which contains x in 2z - 5xz and give coefficient of x?

A. 5z

B.-5

- C. -5z
- $\mathsf{D}.-5x$

#### Answer: C

![](_page_44_Picture_6.jpeg)

4. Term having same algebraic factors are called......

A. Algebraic expressions

B. Unlike term

C. Like terms

D. None of these

#### Answer: C

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5. In algebraic expression  $5x^3 + 3xy + y^2 + 4$ , 4 is a....

A. Like terms

B. Unlike term

C. Zero term

D. Constant

### Answer: D

![](_page_46_Figure_1.jpeg)

#### Answer: D

7. Which statement is true for algebraic expression  $4p^2q - 4pq^2$ ?

A. Monomial

B. Binomial

C. Trinomial

D. Tetranomial

Answer: B

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**8.** If x=0, y=1 then value of algebraic expression  $x^2 - y^3 - 7$ 

A. 8

B. - 8

C. - 6

D. 6

Answer: B

![](_page_48_Figure_5.jpeg)

9. If a=2, b=-2 then value of algebraic expression  $a^2+b^2$  is

A. 0

B. 8

C. - 8

D. 4

Answer: B

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**10.** Algebraic expression  $x^2 - y^2$ = .....

A. 
$$y^2-x^2$$

 $\mathsf{B.}\,x^2+y^2$ 

$$\mathsf{C.}-\left(y^2-x^2\right)$$

D. None of these

Answer: C

![](_page_50_Picture_0.jpeg)

![](_page_50_Figure_1.jpeg)

#### Answer: C

12. What is obtained on simplifying  $(3y^2 + 5y - 9) - (8y - y^2 - 9)$  by combining like terms? A.  $4y^2 + 3y$ B.  $4y^2 - 3y$ C.  $2y^2 - 3y$ 

D. None of these

#### Answer: B

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Other Important Questions Fill In The Blanks

1. Like terms have same algebraic.....

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<b>2.</b> Expression having two or more than two terms is known
as
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<b>3.</b> $\frac{5x}{3} + \frac{7y}{2} + 3$ is aexpression
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4. If side of a square is denoted by x then its perimeter will

be.....

![](_page_53_Picture_2.jpeg)

polygon is .....

**7.** A symbol which takes on various numerical values is called a .....

![](_page_54_Picture_1.jpeg)

1. Constant is a term that has no fixed value

2. If n is a natural number than 2n will always be an even

### number

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<b>3.</b> If n is an odd number then $n^3$ will be an even number.
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<b>4.</b> The coefficient of z in $325x^2yz$ is 325
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5. Numerical co-efficient of  $-25x^3y^2z$  is 25.

![](_page_56_Picture_0.jpeg)

8. If x = -1 then value of expression  $x^2 - 2x + 3$  is 2.