

## CHAPTER 12

# ALGEBRAIC EXPRESSION

---

---

### Poits to Remember :

1. Algebraic Expression is formed from variables and constants.
2. (i) Like terms are those which have same algebraic factors (ii) Terms which have different algebraic factors are called unlike terms.
3. Any expression with one or more terms is called a polynomial. In each term of a polynomial, power of variables is a positive integer.



---

### QUESTIONS

---

1. Add the like terms :  $\frac{2}{3}x^2y$ ,  $\frac{-3}{7}x^2y$ ,  $\frac{2}{7}x^2y^3$
2. Add the unlike terms :  $8x$ ,  $\frac{-4}{3}x$ ,  $\frac{2}{3}y$ ,  $3p$
3. Add the unlike terms :  $1x^2$ ,  $2y$ ,  $3t$ ,  $4x^2$
4. Add the terms :  $x^2$  and  $-3y^2$
5. What is the numerical coefficient of algebraic expression  $13 - y^2$ .
6. Add all the terms :  $12x$ ,  $12$ ,  $25x$ ,  $-25y$ ,  $1$ ,  $x$ ,  $12y$ ,  $y$ ,  $-25$
7. Write the coefficient of  $y^2$  of algebraic expression.  
 $2x^2y - 15xy^2 + 7y^2$
8. Add the algebraic expression :  
 $3x + 11$  and  $-2x + y$
9. Subtract  $x + y$  from  $\frac{3}{2}x - \frac{5}{2}y$
10. Find the value of the following expression for  $x = 2$   
 $15x - 5x^2$

11. Subtract  $24ab - 10b + 18a$  from  $26ab - 8b - 7a$ .
12. What should be added to  $x^2 + y^2$  to get  $2x^2 + 3xy$ ?
13. Find the value of the given algebraic expression when  $x = -2$ ,  $10x - 2$
14. Find the value of the given algebraic expression when  $x = -2$ ,  $5x^2 + 4x - 2$
15. Find the value of Algebraic Expression when  $x = 2$   $x^2 - 3x + 5$
16. Find the value of  $7a - 4b$  when  $a = 2$   $b = -2$
17. Evaluate  $\frac{x}{5} - \frac{y}{5}$  when  $x = 2$   $y = -3$
18. If  $Z = 5$  find the value of  $2 - 3(4 - Z)$
19. If  $P = -6$  find the value of  $\frac{2P^2}{3} - 1$ .
20. If  $a = 2$  find the value of  $a \left(1 + \frac{1}{a}\right)$ .
21. Evaluate :  $2a^2 + 3b^2 + 1c^2$  if  $a = 1$ ,  $b = 0$ ,  $c = -4$
22. Find the value of  $(a - b)(a + b) - (2a - b)(a + b)$  if  $a = 3$ ,  $b = 2$ .
23. If  $a + b = 5$ , find the value of  $\frac{1}{2}a + \frac{1}{2}b$ .
24. Find the value of  $3(2a + b)$  if  $a = 2$ ,  $b = -1$ .
25. Find the value of  $5x + 3$  if  $x = 9$ .
26. What should be added into  $x^2 + 2x$  to obtain  $x^2 + 9$ ?
27. What should be added into  $x^2 + x + a$  to obtain  $x^2 + x - 3$ ?
28. What should be subtracted from  $3a + 7b - 16$  to get  $2a + 8b$ ?
29. If  $a = 3$ ,  $b = -3$ , find the value of  $a^2 + b^2$ .
30. If  $a = 5$ ,  $b = -5$ , find the value of  $a^2 - b^2$ .
31. Simplify the following expression if  $x = 8$   
 $5x + 6(x - 3)$
32. If a side of an equilateral triangle is  $7x$  units then find the perimeter of the triangle.
33. Find the perimeter of a square whose side is  $4a$  cm.
34. Find the perimeter of a regular pentagon whose side is  $4x$  cm.
35. Side of a square is  $2x$  cm. Find its area.
36. Base of a triangle is  $2x$  units and its height is  $3y$  units. Find the area of the triangle.

37. Each  consists of 4 line segments. Find the total number of line-segments in the following figure : 
38. What is the number of diagonals that can be drawn from one vertex in an octagon?
39. What is the number of diagonals that can be drawn from one vertex in a heptagon.
40. Subtract  $x^2 - 3xy + 7y^2 - 5$  from  $6xy - 4x^2 - y^2 + 5$
41. By how much is  $2x^3 + 7x^2 - 5x + 6$  greater than  $x^3 - 2x^2 + x + 5$ ?
42. By how much is  $a^2 - 7a + 5$  less than  $3a^2 + 2a + 5$ ?
43. Subtract  $1 - 5y^2$  from  $y^3 + 7y^2 + y + 1$ .
44. Simplify :  $2x - \{5y - (x - 2y)\}$
45. Simplify :  $5a - \{3a - (2 - a) + 4\}$ .
46. What is the coefficient of  $y$  in the term  $\frac{4}{3}x^2yz^2$ ?
47. Add the algebraic expression :
- (i)  $7x - 4$  and  $3x + 1$
- (ii) Find the coefficient of  $x$ .
48. Add  $a^2 + b^2 + c^2 - 3abc$  and  $a^2 - b^2 + c^2 + abc$ .
49. Add the expressions  $7a - 5ab + 4b$ ,  $-6a - ab - 8b$  and  $-4a + 2ab + 3b$ .
50. Add  $2x^2 - 3x + 1$  to the sum of  $3x^2 - 2x$  and  $3x + 7$ .
51. Simplify :
- (i)  $12a^2b + 3ba^2$
- (ii) Also find the coefficient of the result.

---

## ANSWERS

---

- |  |                                     |
|--|-------------------------------------|
| 1. $\frac{5}{21}x^2y$                        | 2. $\left(\frac{2}{3}y + 3p\right)$ |
| 3. $(2y + 3z)$                               | 4. $x^2 - 3y^2$                     |
| 5. $-1$                                      | 6. $-12x - 12y - 12$                |
| 7. $(-15x, 7)$                               | 8. $(x + y + 11)$                   |
| 9. $\left(\frac{x}{2} - \frac{7}{2}y\right)$ | 10. $10$                            |

11.  $2ab + 2b - 25a$   
13.  $-22$   
15.  $3$   
17.  $1$   
19.  $23$   
21.  $18$   
23.  $\frac{5}{2}$   
25.  $48$   
27.  $-3 - a$   
29.  $18$   
31.  $70$   
33.  $16a$  cm  
35.  $4x^2$  cm<sup>2</sup>  
37.  $16$   
39.  $4$   
41.  $x^3 + 9x^2 - 6x + 1$   
43.  $y^3 + 12y^2 + y$   
45.  $a - 2$   
47.  $10x - 3, 10$   
49.  $-3a - 4ab - b$   
51.  $(15a^2b, 15)$
12.  $x^2 + 3xy + y^2$   
14.  $10$   
16.  $22$   
18.  $5$   
20.  $3$   
22.  $(-15)$   
24.  $9$   
26.  $-2x + 9$   
28.  $(+ a - b - 16)$   
30.  $0$   
32.  $21x$  units  
34.  $20x$  cm  
36.  $3xy$  square units  
38.  $5$   
40.  $9xy - 5x^2 - 8y^2 + 10.$   
42.  $2a^2 + 9a$   
44.  $3x - 7y$   
46.  $\frac{4}{3}x^2z^2$   
48.  $2a^2 + 2c^2 - 2abc$   
50.  $5x^2 - 2x + 8$