CHAPTER 9
ALGEBRAIC EXPRESSION AND IDENTITES
ASSIGNMENTS

1. Write two examples of each of
   (i) Monomials
   (ii) Binomials
   (iii) Trinomials

2. Identify the like expressions.
   $5x, -14x, 3x^2 + 1, x^2, -9x^2, xy, -3xy$

3. Identify the terms and their coefficients for each of the following expressions:
   (i) $3x^2y - 5x$
   (ii) $xyz - 2y$
   (iii) $-x - x^2$

4. Add: $-3a^2b^2$, $-5/2\ a^2b^2$, $4a^2b^2$, $2/3\ a^2b^2$

5. Add: $8x^2 + 7xy - 6y^2$, $4x^2 - 3xy + 2y^2$ and $-4x^2 + xy - y^2$

6. Subtract: $(4x + 5)$ from $(-3x + 7)$

7. Subtract: $3x^2 - 5x + 7$ from $5x^2 - 7x + 9$

8. Multiply the following expressions:

   (a) $3xy^2 \times (-5x^2y)$ (b) $1/2\ x^2yz \times 2/3\ xy^2z \times 1/5\ x^2yz$

9. Find the area of the rectangle whose length and breadths are $3x^2y$ m and $5xy^2$ m respectively.

10. Multiply $x^2 + 7x - 8$ by $-2y$.

11. Simplify the following:
    (i) $a^2 (b^2 – c^2) + b^2 (c^2 – a^2) + c^2 (a^2 – b^2)$
    (ii) $x^2(x – 3y^2) – xy(y^2 – 2xy) – x(y^3 – 5x^2)$
12. Multiply $(3x^2 + 5y^2)$ by $(5x^2 – 3y^2)$
13. Multiply $(6x^2 – 5x + 3)$ by $(3x^2 + 7x – 3)$

14. Simplify:
    $2x^2(x + 2) – 3x (x^2 – 3) – 5x(x + 5)$

15. Multiply $x^2 + 2y$ by $x^3 – 2xy + y^3$ and find the value of the product for x = 1 and y = -1.

16. Using suitable identity find:
    (i) 48^2
    (ii) 96^2
    (iii) $231^2 – 131^2$
    (iv) 97×103
    (v) $181^2 – 19^2 = 162 \times 200$

17.

If $x^2 + \frac{1}{x^2} = 38$, find the values of:

(*i*) $x - \frac{1}{x}$ (*ii*) $x^4 + \frac{1}{x^4}$

18. Verify that $(11pq + 4q)^2 – (11pq – 4q)^2 = 176pq^2$

19. Find the value of x, if $10000x = (9982)^2 – (18)^2$

20. Find the value of: $x^2 – 1/5$ at x= -1.

21. What is the value of $x^2 + y^2 – 10$ at x = 0 and y = 0?

22. Find the product of 9a, 4ab and -2a.

23. Simplify (a + b + c) (a + b - c).

24. Using identities evaluate: 8.56 x11.60.

25. Using identities evaluate: $(99)^2$.

26. Simplify $x(2x - 1) + 5$ and find its value at $x = -2$.

27. Evaluate the value of $(95)^2$ using identities.

28. Add: $a + b + ab$; $b - c + bc$ and $c + a + ac$.

29. Verify the identity $(x + a)(x + b) = x^2 + (a + b)x + ab$ for $a = 2$, $b = 3$ and $x = 4$.

30. Find the volume of cuboid whose dimensions are $(x^2 - 2)$; $(2x + 4)$ and $(x - 3)$.

31. Write the terms and coefficients of $3 - xy + yz - xz$.

32. Simplify: $(a + b + c)(a + b - c)$. (2)

33. Simplify the expression $x(2x-1) + 5$ and its value at $x = -2$.

34. Using suitable identities find $(xy + 3p)^2$.

35. Subtract $5x^2 - 6y^2 + 8y - 5$ from $7x^2 - 5xy + 10y^2 + 5x - 4y$.

36. Use a suitable identity to get each of the following products.

a) $(p - 11)(p + 11)$
b) $(2y + 5)(2y - 5)$
c) $(12a - 9)(12a + 9)$
d) $(2a-1/2)(2a-1/2)$
e) $(1.1m - 0.4)(1.1m + 0.4)$
f) $(a^2 + b^2)(-a^2 + b^2)$
g) $(6x - 7)(6x + 7)$
h) $(-a/2 + c/2)(-a/2 + c/2)$
i) $[(p/8)+(3q/4)][(p/8)+(3q/4)]$
j) $(3a + 9b)(3a - 9b)$
k) $2(a - 9)^2$
l) $5(xy - 3z)^2$
m) $(6x + 5y)^2$
n) $36[(3p/2\}) + (2q/3)]^2$

o) $(x - 0.5y)^2$

p) $(2xy - 5y)^2$

37. Use the identity $(x + a)(x + b) = x^2 + (a + b)x + ab$ to find the following products.

(i) $(p + 10)(p + 11)$

(ii) $(4x + 9)(4x + 12)$

(iii) $(x - 5)(x - 1)$

(iv) $(9x - 5)(9x - 1)$

(v) $(2x + 5y)(2x + 3y)$

(vi) $(2a^2 + 9)(2a^2 + 5)$

38. Simplify the following

(i) $(x^2 - y^2)^2 + 4x^2y^2$

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

(iii) $(2m - 8n)^2 + (2m + 8n)^2$

(iv) $(4m + 5n)^2 + (5m + 4n)^2 + (4m + 5n)(4m - 5n)$

(v) $(.5p - 1.5q)^2 - (.5p - 1.5q)^2 + p^2q^2$

(vi) $(ab - bc)^2 + 2ab^2c$

(vii) $(m^2 - n^2m)^2 + 2m^2n^2$