Chap.9 ALGEBRAIC EXPRESSIONS AND IDENTITIES

1. Multiply the following.

   (i) $11x^2y$ and $2x^2y^2$ (ii) $3y^2$ and $7y^5$ (iii) $5x^3$ and $4x^9$ (iv) $-9xy$ and $4x^2z$

2. Find the products of.

   (i) $(-2xy^2)(5y)(-3z^2)$ (ii) $(ab)(bc)(ca)$

   (iii) $(6a^2b)(-2b^2c)(3ac^2)$ (iv) $\left(\frac{5}{9}ab\right)\left(\frac{9}{7}bc\right)\left(\frac{-7}{5}ca\right)$

3. Find the value of $(3p^2q)\times(8q^3)$, when $p=1$ and $q=\left(-\frac{1}{4}\right)$.

4. Find the value of $(-8x^2y^3)\times\left(\frac{1}{5}xy^2\right)$, when $x=-1$ and $y=2$.

5. Find the product of $(3a^2b^3)$, $(-7a^2)$ and $(5a^2b^2)$, and then verify the result for $a=2$ and $b=3$.

6. Find the product of $\left(-\frac{3}{4}xy^2z\right)$ and $(-2z^2)$, then verify the result for $x=1$, $y=2$ and $z=3$.

7. Verify $a^2b^2c^2=(ab)\times(bc)\times(ca)$, for $a=3$ and $b=4$.

8. Find the product and then verify the following for $a=2$ and $b=-5$.

   (i) $a(a^2-ab^2)$ (ii) $\frac{2}{7}a\left(ab-\frac{7}{6}ab^2\right)$

9. Find the product of the following.

   (i) $2x(3x+y^2)$ (ii) $(-3y)(x^2+3xy)$

   (iii) $3a^2(4a-5a^2)$ (iv) $-8a^2b(-3a^2-2b)$

   (v) $\frac{-5}{9}abc\left(\frac{18}{15}a^2bc-\frac{3}{10}abc^2\right)$ (vi) $7a(0.1a^2-0.5b)$

10. Multiply $\frac{5}{9}y^2z$, $\frac{7}{10}x^2$ and $(-3xz^2)$, and then verify the result for $x=\frac{1}{2}$, $y=\frac{1}{3}$ and $z=\frac{1}{4}$.

11. Find the following products and verify the results for $x=-1$ and $y=-2$.

   (i) $(3x^2+2y^2)(x+y)$ (ii) $(x^2-y^2)(x^2+y^2)$

   (iii) $\left(3x^2+\frac{1}{3}y^2\right)(2y-3x^2)$ (iv) $(x^4-y^4)(x+y)$

   (v) $\left(\frac{1}{2}x-y\right)\left(\frac{3}{5}x+y\right)$ (vi) $(0.7x-0.6y)(2.3x-2y)$

12. Find the products of the following.

   (i) $(3x-2)(5x^2+6x+2)$ (ii) $(x^2+y^2+z^2)(xy+yz)$

   (iii) $(x+y)(x^2-xy+y^2)$ (iv) $(5x^2+y)(3x+2y)$

   (v) $(x^3+y^3)(x^2-xy+y^2)$ (vi) $\left(\frac{3}{5}x^2-3y+2\right)\left(\frac{1}{3}x-y\right)$

13. Simplify.

   (i) $(3y+2)(y-2)-(7y+3)(y-4)$ (ii) $(2x-3y)(x+y)-(5x+2y)(x-y)$

   (iii) $x^2+(3x-y)(3x+y+y^2)$ (iv) $(a^2-3a+5)(2a-3)-(5a^2+3a-3)(a-1)$

14. Find the products of the following.

(i) $(2x - y)(3x + y^2)$ (ii) $(x - 3y)(x^2 + 3xy)$ (iii) $\left(x^3 + \frac{1}{x^3}\right)\left(x + \frac{1}{2}\right)$

(iv) $(x^2 - a^2)(x - a)$ (v) $\left(\frac{2}{7}x + \frac{3}{5}y\right)(x^2 + y^2)$ (vi) $(a^2b + ab^2)(b^2c + c^2b)$

15. Find the following products. by using identities

(i) $(5x + 9)(5x - 9)$ (ii) $(x^3 + y^2)(x^3 - y^2)$

(iii) $(x^2y + 3z)(x^2y - 3z)$ (iv) $\left(x + \frac{1}{x}\right)\left(x - \frac{1}{x}\right)$

16. Find the following products.

(i) $(5x - 3y)(5x - 3y)$ (ii) $(y - 3)(y - 3)$

(iii) $(x^2 - 5)(x^2 - 5)$ (iv) $\left(\frac{3}{4}x - \frac{5}{6}y\right)\left(\frac{3}{4}x - \frac{5}{6}y\right)$

17. Find the following products.

(i) $(x + 3)(x + 3)$ (ii) $(2a + 3b)(2a + 3b)$

(iii) $\left(\frac{7}{9}x + y\right)\left(\frac{7}{9}x + y\right)$ (iv) $\left(\frac{2}{3}x + 5\right)\left(\frac{2}{3}x + 5\right)$

18 Simplify using identities.

(i) $133 \times 133 - 121 \times 121$ (ii) $5.89 \times 5.89 - 0.11 \times 0.1$

(iii) $\frac{93 \times 93 - 5 \times 5}{88}$ (iv) $\frac{3.29 \times 3.29 - 0.17 \times 0.17}{3.12}$

14. Find the value of the expression $36x^2 + 60xy + 2y^2$, when $x = 4$ and $y = -7$.

20. Find the value of the following expressions, when $x = 4$ and $y = 7$.

(i) $49x^2 + 126xy + 81y^2$ (ii) $4x^2 - 12xy + 9y^2$ (iii) $(x^4 - y^4)$

21. If $\left(x + \frac{1}{x}\right) = 3$, find the value of $\left(x^2 + \frac{1}{x^2}\right)$.

22. Using the identities, evaluate the following.

(i) 102^2 (ii) 311^2 (iii) 72^2 (iv) 89^2

(v) 118^2 (vi) 989^2 (vii) 13×7 (viii) 73×67

(ix) 9.3×8.7 (x) 12.5×11.5 (xi) 105×95 (xii) 153×147