

INTERNATIONAL INDIAN SCHOOL BURAIDAH

Worksheet for the Academic Year 2026-27

CLASS: IX

SUBJECT: Mathematics

DATE: 30/06/26

LESSON 4 : EXPLORING ALGEBRAIC IDENTITIES

1. If $x^2 + kx - 3 = (x - 3)(x + 1)$, then k is

[a] 2 b) -2 c) 3 d) -3]

2. If $(x+1)$ is a factor of $(2x^2 + kx)$, then k is

[a] -3 b) -2 c) 2 d) 4]

3. If $\frac{x}{y} + \frac{y}{x} = -1$, then $x^3 - y^3$ is

[a] 1 b) -1 c) 0 d) $\frac{1}{2}$]

4. If $a + b + c = 0$, then $a^3 + b^3 + c^3$ is

[a] 0 b)abc c) 2abc d) 3abc]

5. The value of $369^2 - 368^2$ is

[a] 1^2 b) 81 c) 37 d) 737]

6) The coefficient of x in the expansion of $(x + 3)^3$ is

[a] 1 b) 9 c) 18 d) 27]

7) If $a+b+c=0$, then $\frac{a^2}{bc} + \frac{b^2}{ca} + \frac{c^2}{ab} =$

[a] 1 b) 0 c) -1 d) 3]

8. If $x + y + z = 8$ and $xy + yz + xz = 19$, the value of $(a^2 + b^2 + c^2) =$

[a] 11 b)26 c) 16 d)27]

9. $1.5^3 - 0.8^3 - 0.7^3 =$

[a] 5.6 b) 1 c) 0 d) 2.52]

10. If $x + y + z = 9$ and $xy + yz + xz = 23$, the value of $(x^3 + y^3 + z^3 - 3xyz) =$

[a] 108 b) 207 c) 669 d) 729]

11. Simplify: $(2x - 5y)^3 - (2x + 5y)^3$

[Ans: $-120yx^2 - 250y^3$]

12. If $a + b = 13$ and $ab = 25$, find the value of $a^3 + b^3$

[Ans: 1222]

13. If $x + \frac{1}{x} = 5$, find the value of $(x^2 + \frac{1}{x^2})$

[Ans: 23]

14. Expand:

$$a))(\frac{3}{7}a + 2b)^2 \quad b) (\frac{2x}{3} - \frac{1}{4}y)^2 \quad c) (7x + \frac{1}{2})(7x - \frac{1}{2}) \quad d) (-3x + \frac{3}{2}y - 5z)^2$$

$$e) (2x + 4)(2x - 3) \quad f) (5y - 4)(3y - 7) \quad g)(3a + \frac{b}{2})^3 \quad h)(\frac{x}{4} - 1)^3$$

15. Factorize:

$$a) 4a(x - 3y) - 2b(3y - x) \quad b) 48ax^2 - 75ay^2 \quad c) 9x^2 - 4y^2 - 12x + 4 \quad d) 3x^3 - \frac{1}{3}x$$

$$e)x^4 - y^4 \quad f)x^4 - \frac{16}{y^4} \quad g)x^8 - y^8 \quad h) x^3 - \frac{1}{x^3} \quad i) 10\left(3x + \frac{1}{x}\right)^2 - (3x + \frac{1}{x}) - 3$$

$$j) 121 - 2ab - (a^2 + b^2)$$

$$16. \text{ If } \left(x + \frac{1}{x}\right) = 2\frac{1}{12}, \text{ find the value of } \left(x - \frac{1}{x}\right) \quad [\text{Ans: } 7/12]$$

$$17. \text{ If } x + y + z = 1, xyz = -1 \text{ and } xy + yz + xz = -1, \text{ find the value of } x^3 + y^3 + z^3. \quad [\text{Ans: } 1]$$

$$18. \text{ Factorize: } (p - q)^3 + (q - r)^3 + (r - p)^3. \quad [\text{Ans: } 3(p-q)(q-r)(r-p)]$$

$$19. \text{ If } p = 2 - a, \text{ prove that } a^3 + 6ap + p^3 - 8 = 0.$$

$$20. \text{ Find the product: } (a - b - c)(a^2 + b^2 + c^2 + ab + bc + ca) \quad [\text{Ans: } a^3 - b^3 - c^3 - 3abc]$$