



CLASS 9 MATHEMATICS



CHAPTER 4 – EXPLORING ALGEBRAIC IDENTITIES



MCQ WORKSHEET | Ganita Manjari | 2026–27

Name: _____

Class: IX Section: _____

Date: _____



Instructions

- Choose the **one correct answer**.
 - Attempt all questions.
 - **Total: 40 MCQs**
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PART A – ALGEBRAIC IDENTITIES

1. Which of the following is the correct identity for the square of a sum?

- A. $(a+b)^2 = a^2+b^2$
 - B. $(a+b)^2 = a^2+2ab+b^2$
 - C. $(a+b)^2 = a^2-2ab+b^2$
 - D. $(a+b)^2 = a^2-b^2$
-

2. The expansion of $(a-b)^2$ is:

- A. a^2-b^2
 - B. $a^2+2ab+b^2$
 - C. $a^2-2ab+b^2$
 - D. $a^2+2ab-b^2$
-

3. Which identity represents the difference of two squares?

- A. $(a+b)^2$
 - B. $(a-b)^2$
 - C. $(a+b)(a-b)$
 - D. $(a+b)^3$
-

4. $(x+5)^2$ is equal to:

- A. x^2+25
 - B. $x^2+5x+25$
 - C. $x^2+10x+25$
 - D. $x^2-10x+25$
-

5. $(x-7)^2$ is equal to:

- A. $x^2-14x+49$
 - B. $x^2+14x+49$
 - C. x^2-49
 - D. x^2+49
-

6. $(3x+2y)^2$ is:

- A. $9x^2+4y^2$
 - B. $9x^2+12xy+4y^2$
 - C. $9x^2+6xy+4y^2$
 - D. $3x^2+12xy+2y^2$
-

7. $(4a-3b)^2$ is:

- A. $16a^2-9b^2$
- B. $16a^2+24ab+9b^2$

- C. $16a^2 - 24ab + 9b^2$
 - D. $16a^2 - 12ab + 9b^2$
-

8. $(x+3)(x-3)$ equals:

- A. $x^2 + 9$
 - B. $x^2 - 9$
 - C. $x^2 - 6x + 9$
 - D. $x^2 + 6x + 9$
-

PART B – CUBIC IDENTITIES

9. The expansion of $(a+b)^3$ is:

- A. $a^3 + b^3$
 - B. $a^3 + 3a^2b + 3ab^2 + b^3$
 - C. $a^3 - 3a^2b + 3ab^2 - b^3$
 - D. $a^3 + ab + b^3$
-

10. $(a-b)^3$ is:

- A. $a^3 - 3a^2b + 3ab^2 - b^3$
 - B. $a^3 + 3a^2b + 3ab^2 + b^3$
 - C. $a^3 - b^3$
 - D. $a^3 + 3ab^2 + b^3$
-

11. Which identity is correct?

- A. $a^3 + b^3 = (a+b)(a^2 + ab + b^2)$
- B. $a^3 + b^3 = (a+b)(a^2 - ab + b^2)$
- C. $a^3 + b^3 = (a-b)(a^2 - ab + b^2)$
- D. $a^3 + b^3 = (a+b)(a^2 + b^2)$

12. The factorisation of $a^3 - b^3$ is:

- A. $(a+b)(a^2 - ab + b^2)$
 - B. $(a-b)(a^2 + ab + b^2)$
 - C. $(a-b)(a^2 - ab + b^2)$
 - D. $(a+b)(a^2 + ab + b^2)$
-

13. $x^3 + 8$ can be written as:

- A. $x^3 + 2^3$
 - B. $x^3 + 8^2$
 - C. $x^2 + 2^3$
 - D. $(x+8)^3$
-

14. The factorisation of $x^3 + 27$ is:

- A. $(x+3)(x^2 + 3x + 9)$
 - B. $(x-3)(x^2 + 3x + 9)$
 - C. $(x+3)(x^2 - 3x + 9)$
 - D. $(x-3)(x^2 - 3x + 9)$
-

PART C – FACTORISATION

15. Factorise:

$$x^2 + 8x + 16$$

- A. $(x+4)^2$
- B. $(x-4)^2$
- C. $(x+8)^2$
- D. $(x+16)^2$

16. Factorise:

$$x^2 - 12x + 36$$

- A. $(x+6)^2$
 - B. $(x-6)^2$
 - C. $(x-12)^2$
 - D. $(x-3)^2$
-

17. Factorise:

$$25x^2 - 49$$

- A. $(5x-7)^2$
 - B. $(5x+7)^2$
 - C. $(5x-7)(5x+7)$
 - D. $(25x-49)(25x+49)$
-

18. Factorise:

$$9a^2 - 16b^2$$

- A. $(3a-4b)(3a+4b)$
 - B. $(9a-16b)^2$
 - C. $(3a-4b)^2$
 - D. $(9a+16b)(9a-16b)$
-

19. Which expression is a perfect square?

- A. $x^2 + 6x + 9$
 - B. $x^2 + 6x + 8$
 - C. $x^2 - 9$
 - D. $x^2 + 3$
-

20. $4x^2+12x+9$ can be factorised as:

- A. $(2x+3)^2$
 - B. $(2x-3)^2$
 - C. $(4x+3)^2$
 - D. $(2x+9)^2$
-

PART D – IDENTITIES & NUMERICAL CALCULATIONS

21. The value of 99^2 can be quickly found using:

- A. $(100-1)^2$
 - B. $(100+1)^2$
 - C. $(90+9)^2$
 - D. $(100-9)^2$
-

22. 101^2 is:

- A. 10,001
 - B. 10,201
 - C. 10,101
 - D. 9,999
-

23. 103×97 is equal to:

- A. 100^2+3^2
 - B. 100^2-3^2
 - C. 103^2-97^2
 - D. 100^2-6
-

24. The value of 48×52 is:

- A. 2,496
 - B. 2,500
 - C. 2,504
 - D. 2,400
-

25. Which identity can be used to calculate 999×1001 easily?

- A. $(1000-1)(1000+1)$
 - B. $(1000+1)^2$
 - C. $(1000-1)^2$
 - D. $(999+1001)^2$
-

26. Using an identity:

75^2

can be written as:

- A. $(70+5)^2$
 - B. $(75+5)^2$
 - C. $(80-5)^2$
 - D. Both A and C
-

PART E – VISUALISING IDENTITIES

27. The identity $(a+b)^2 = a^2+2ab+b^2$ can be represented geometrically by:

- A. A circle
 - B. A square divided into smaller squares and rectangles
 - C. A triangle only
 - D. A straight line
-

28. In the geometric representation of $(a+b)^2$, the two rectangular regions each have area:

- A. a^2
 - B. b^2
 - C. ab
 - D. $2ab$
-

29. The total area of a square of side $(a+b)$ is:

- A. a^2+b^2
 - B. a^2+ab+b^2
 - C. $a^2+2ab+b^2$
 - D. $2a^2+2b^2$
-

30. Algebra tiles can be used to:

- A. Understand algebraic expressions visually
 - B. Measure angles only
 - C. Calculate circumference only
 - D. Draw graphs only
-

PART F – RATIONAL EXPRESSIONS & HIGHER-ORDER MCQs

31. Which of the following is a rational expression?

- A. $1/(x+2)$
 - B. $\sqrt{x+2}$
 - C. $x^2+\sqrt{x}$
 - D. πx
-

32. For the expression:

$$1/(x-3)$$

the value of x cannot be:

- A. 0
 - B. 2
 - C. 3
 - D. 4
-

33. Simplify:

$$(x^2-9)/(x-3), \text{ where } x \neq 3.$$

- A. $x-3$
 - B. $x+3$
 - C. x^2+3
 - D. $x-9$
-

34. Which identity is most useful for simplifying:

$$x^2-25?$$

- A. $(a+b)^2$
 - B. $(a-b)^2$
 - C. $(a+b)(a-b)$
 - D. $(a+b)^3$
-

35. If:

$$x + 1/x = 5$$

then:

$$x^2 + 1/x^2$$

is:

- A. 21
 - B. 23
 - C. 25
 - D. 27
-

36. If:

$$a+b = 10$$

and

$$ab = 21$$

then:

$$a^2+b^2$$

equals:

- A. 42
 - B. 58
 - C. 79
 - D. 100
-

37. If:

$$a-b = 5$$

and

$$ab = 6$$

then:

$$a^2+b^2$$

is:

- A. 13
- B. 25
- C. 37
- D. 49

38. Which statement is correct?

- A. An identity is true only for one value of the variable.
 - B. An identity is true for all permissible values of the variables.
 - C. An identity never contains variables.
 - D. An identity is always an equation with no solution.
-

39. Which expression is equivalent to:

$$(2x+5)^2 - (2x-5)^2?$$

- A. $20x$
 - B. $10x$
 - C. $40x$
 - D. $25x$
-

40. If:

$$x+y = 7$$

and

$$x-y = 3$$

then $x^2 - y^2$ is:

- A. 10
 - B. 21
 - C. 28
 - D. 49
-



ANSWER KEY

Q Ans Q Ans Q Ans Q Ans

1	B	11	B	21	A	31	A
2	C	12	B	22	B	32	C
3	C	13	A	23	B	33	B
4	C	14	C	24	B	34	C
5	A	15	A	25	A	35	B
6	B	16	B	26	D	36	B
7	C	17	C	27	B	37	C
8	B	18	A	28	C	38	B
9	B	19	A	29	C	39	C
10	A	20	A	30	A	40	B

CHAPTER 4 QUICK REVISION

★ Important Identities

$$(a+b)^2 = a^2 + 2ab + b^2$$

$$(a-b)^2 = a^2 - 2ab + b^2$$

$$(a+b)(a-b) = a^2 - b^2$$

$$(a+b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$$

$$(a-b)^3 = a^3 - 3a^2b + 3ab^2 - b^3$$

$$a^3+b^3 = (a+b)(a^2-ab+b^2)$$

$$a^3-b^3 = (a-b)(a^2+ab+b^2)$$

Remember

Identity → true for all permissible values.

Expansion → removing brackets using identities.

Factorisation → expressing an algebraic expression as a product of factors.

Visualisation → identities can be represented using squares, rectangles and algebra tiles.

Difference of squares:

$$a^2 - b^2 = (a+b)(a-b)$$

 **Score**

36–40:  Algebra Identity Expert!

30–35:  Excellent!

24–29:  Good!

Below 24:  Revise Chapter 4 and try again!