

MATHEMATICS**CLASS 9****Chapter 4: Exploring Algebraic Identities****WORKSHEET**

Name: _____

Class/Section: _____

Date: _____

Instructions: Choose the correct option (A, B, C or D) for each question.

Q1. Which of the following is an algebraic identity?

A. $x + 2 = 7$

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

C. $2x = 10$

D. $x - 3 = 4$

Q2. 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. $a^2 - b^2$

Q3. The expansion of $(a - b)^2$ is:

A. $a^2 + 2ab + b^2$

B. $a^2 - 2ab + b^2$

C. $a^2 - b^2$

D. $a^2 + b^2$

Q4. Which identity represents the difference of two squares?

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

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

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

D. $(a + b)^3 = a^3 + b^3$

Q5. The value of 35^2 is:

A. 1125

B. 1225

C. 1325

D. 1425

Q6. The value of 65^2 is:

A. 4125

B. 4225

C. 4325

D. 4425

Q7. Using an identity, 99^2 can be written as:

A. $(100 - 1)^2$

B. $(100 + 1)^2$

C. $(90 + 9)^2$

D. $(98 + 1)^2$

Q8. What is the value of $(x + 3)^2$?

A. $x^2 + 3x + 9$

B. $x^2 + 6x + 9$

C. $x^2 + 9x + 3$

D. $x^2 - 6x + 9$

Q9. What is the value of $(2x - 5)^2$?

A. $4x^2 - 10x + 25$

B. $4x^2 - 20x + 25$

C. $2x^2 - 20x + 25$

D. $4x^2 + 20x + 25$

Q10. Which expression is the factorisation of $x^2 - 25$?

A. $(x - 5)^2$

B. $(x + 5)^2$

C. $(x - 5)(x + 5)$

D. $x(x - 25)$

Q11. The expression $x^2 + 10x + 25$ is equal to:

A. $(x - 5)^2$

B. $(x + 5)^2$

C. $(x + 10)^2$

D. $(x - 25)^2$

Q12. The expression $x^2 - 14x + 49$ is equal to:

A. $(x + 7)^2$

B. $(x - 7)^2$

C. $(x - 14)^2$

D. $(x + 14)^2$

Q13. Which is the correct identity for $(a + b + c)^2$?

A. $a^2 + b^2 + c^2 + ab + bc + ca$

B. $a^2 + b^2 + c^2 + 2ab + 2bc + 2ca$

C. $a^2 + b^2 + c^2 - 2ab - 2bc - 2ca$

D. $a^2 + b^2 + c^2 + 2abc$

Q14. The value of $(x + y)(x - y)$ is:

A. $x^2 + y^2$

B. $x^2 - y^2$

C. $x^2 - 2xy + y^2$

D. $x^2 + 2xy + y^2$

Q15. Which of the following is the correct identity for $(a + b)^3$?

A. $a^3 + b^3$

B. $a^3 + 3a^2b + 3ab^2 + b^3$

C. $a^3 - 3a^2b + 3ab^2 - b^3$

D. $a^3 + 3ab + b^3$

Q16. The expansion of $(a - b)^3$ 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. $a^3 + b^3$

Q17. 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. $(a - b)(a^2 - ab + b^2)$

Q18. 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. $(a - b)(a^2 - ab - b^2)$

Q19. Which identity is useful for $x^3 + y^3 + z^3 - 3xyz$?

A. $(x + y)^2$

B. $x^2 - y^2$

C. $x^3 + y^3 + z^3 - 3xyz = (x+y+z)(x^2+y^2+z^2-xy-yz-zx)$

D. $(x - y)^2$

Q20. If $a + b = 10$ and $ab = 21$, then $(a + b)^2$ equals:

A. 42

B. 79

C. 100

D. 121

Q21. If $x + y = 8$ and $xy = 15$, then $x^2 + y^2$ is:

A. 34

B. 49

C. 64

D. 79

Q22. Which of the following is a factor of $x^2 - 9$?

A. $x - 2$

B. $x + 2$

C. $x - 3$

D. $x + 4$

Q23. The expression $4x^2 - 25$ can be factorised as:

A. $(2x - 5)(2x + 5)$

B. $(4x - 5)(x + 5)$

C. $(2x - 25)(2x + 1)$

D. $(x - 5)(4x + 5)$

Q24. If $a + b + c = 0$, then $a^3 + b^3 + c^3 - 3abc$ is:

A. 0

B. 1

C. $3abc$

D. $a+b+c$

Q25. Which method can be used to simplify many algebraic expressions efficiently?

A. Guessing values only

B. Algebraic identities and factorisation

C. Drawing circles only

D. Measuring angles only

ANSWER KEY

Question	Correct Option	Answer
1	B	$(a + b)^2 = a^2 + 2ab + b^2$
2	C	$a^2 + 2ab + b^2$
3	B	$a^2 - 2ab + b^2$
4	C	$(a + b)(a - b) = a^2 - b^2$
5	B	1225
6	B	4225
7	A	$(100 - 1)^2$
8	B	$x^2 + 6x + 9$
9	B	$4x^2 - 20x + 25$
10	C	$(x - 5)(x + 5)$
11	B	$(x + 5)^2$
12	B	$(x - 7)^2$
13	B	$a^2 + b^2 + c^2 + 2ab + 2bc + 2ca$
14	B	$x^2 - y^2$
15	B	$a^3 + 3a^2b + 3ab^2 + b^3$
16	A	$a^3 - 3a^2b + 3ab^2 - b^3$
17	A	$(a + b)(a^2 - ab + b^2)$
18	B	$(a - b)(a^2 + ab + b^2)$
19	C	$(x+y+z)(x^2+y^2+z^2-xy-yz-zx)$
20	C	100
21	A	34
22	C	$x - 3$
23	A	$(2x - 5)(2x + 5)$
24	A	0
25	B	Algebraic identities and factorisation

Chapter coverage: visualising and applying algebraic identities, square identities, difference of squares, three-term square identity, factorisation, cube identities, sum and difference of cubes, and simplification using identities.