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Worksheet: Algebraic Expressions and Identities

1. Find the value of x, if $10000x = (9982)^2 – (18)^2$
2. Calculate the volume of a cuboidal box whose dimensions are 5x, $3x^2$, and 7x^4.
3. Shiv works in a mall and gets paid Rs 50 per hour. Last week he worked for 7 hours and this week he will work for x hours. Write an algebraic expression for the money paid to him for both the weeks.
4. Find the value of $(38^2 – 22^2) / 16$ using a suitable identity.
5. If the sum of two numbers is (a + b) and their difference is (a – b), find the product of the numbers.
6. Find the value of 2x + 3y when x = 4 and y = 5.
7. Simplify: $(x + y)^2 + (y + z)^2 + (z + x)^2 – (x^2 + y^2 + z^2)$
8. Arjun bought a rectangular plot with length x and breadth y and then sold a triangular part of it whose base is y and height is z. Find the area of the remaining part of the plot.
9. Multiply $(6x^2 – 5x + 3)$ by $(3x^2 + 7x – 3)$
10. The area of a rectangle is uv, where u is the length and v is the breadth. If the length is increased by 5 units and the breadth is decreased by 3 units, find the new area of the rectangle.
11. Simplify $7x^2(3x – 9) + 3$ and find its value for x = 4 and x = 6.
12. Subtract $5xy(x + y – 5)$ from $x(6x^2 – 7y + 5) + xy(x + y)$
13. Using identities, evaluate 8.56 × 11.60
14. Rohan purchased a rectangular plot whose two adjacent sides are (y – 6x + 32 + 8) and (x – 2y – 5z – 8). He wants to put a wire fence twice around it. Find the total length of wire needed.
15. Find the value of $(3x + 4)^2$ when x = 2.
16. Simplify: $[(a + b)^2 – (a – b)^2] ÷ (2ab)$
17. Factorize: $(x^2 + 2x + 1) – (y^2 + 2y + 1)$
18. Determine the product of $(3a + 2b)$ and $(9a^2 – 6ab + 4b^2)$.
19. The side of a square is (x + 3). Find the expression for its area.
20. How much is $21a^3 – 17a^2$ less than $89a^3 – 64a^2 + 6a + 16$?