Elementary Algebra Problem Set

1. Calculate $2^3 \cdot 2^4$.
2. Simplify the expression $\frac{1}{5^2} \cdot (25^2 - 5^2)$.
3. If $3^x = 27$, find the value of x.
4. Evaluate $\sqrt[3]{64} + \sqrt{49}$.
5. Simplify $\left(\frac{2}{3}\right)^{-3}$.
6. Factorize the expression $x^2 - 4$.
7. Find the value of a if $4a + 5 = 21$.
8. Solve the equation $2x - 3 = 0$.
9. If $(x - 5)(x - 2) = 0$, find the values of x.
10. Simplify $\frac{\frac{2}{3}}{\frac{4}{5}}$.
11. Simplify $\sqrt[5]{32}$.
12. Find the roots of the quadratic equation $x^2 - 5x + 6 = 0$.
13. Solve the system of equations:

$$\begin{aligned} x + y &= 10 \\ 2x - y &= 8 \end{aligned}$$

14. Express $(2x - 3y)^2$ in expanded form.
15. Divide $15x^2y^2$ by $3xy$.
16. Solve for y in the equation $2y + 5 = 3y - 2$.
17. Find x if $x^2 - 5x = 0$.
18. Expand and simplify the expression $(a + b)(a - b)$.
19. If $2^{3x} = 32$, find the value of x.

20. Solve the inequality $2x + 1 > 5$.

21. Determine the area of a triangle with a base of 10 cm and a height of 7 cm.

22. Solve the quadratic equation by completing the square: $x^2 + 6x + 9 = 0$.

23. What is the value of $x^3 + 5x^2 - x + 3$ if $x = 2$?

24. Solve the following system of equations for a and b:

$$\begin{aligned} 3a + 4b &= 15 \\ 5a - 3b &= 10.5 \end{aligned}$$

25. Compute the sum: $\sum_{k=1}^{5} k^2$.

26. Given $f(x) = 2x^2 - 4x + 1$, find $f(-2)$.

27. Using the Pythagorean Theorem, solve for the hypotenuse of a right-angled triangle with legs of lengths 3 cm and 4 cm.

28. Evaluate $\log_2(64)$.

29. Evaluate $5^2 - 2^3$.

30. Simplify the expression $(3x^2 \cdot x^3)/(x^4)$.

31. Solve for y: $4^y = 64$.

32. Express 81 as a power of 3.

33. Calculate and simplify $\left(\frac{4}{7}\right)^2 \cdot \left(\frac{7}{4}\right)$.

34. Factor the expression $x^2 - 9x + 14$.

35. Solve the equation $5x - 9 = 3x + 7$.

36. If $(x + 3)(x + 4) = 0$, find the values of x.

37. Calculate the value of x when $x^{1/2} = 16$.

38. Simplify the sum $\frac{5}{8} + \frac{5}{12}$.

39. Find x if $\log_3 27 = x$.

40. Write $(3x + 4)^2$ in expanded form.

41. Multiply $\frac{3x}{2y}$ by $\frac{4y}{5x}$.

42. Solve $6 = 2x - 4x$.

43. Simplify $(x + 5)^2$.

44. If $x^3 = 125$, find x.

45. Simplify $2^{2x} \cdot 2^5$.

46. Find the solution to the equation $3x - 6 < 9$.

47. Calculate the perimeter of a square with a side length of 5 cm.

48. Solve the equation $16x^2 - 9 = 0$ by factoring.

49. What is the result of dividing $x^2 + 3x + 2$ by $x + 2$?

50. Find a and b if $5a - 4b = 4$ and $a + 3b = 16$.

51. Evaluate the expression $\sum_{n=1}^{4} 2^n$.

52. If $f(x) = x^2 - 6x + 9$, find $f(3)$.

53. Determine the volume of a cube with edges of length 4 cm.

54. Find the slope of the line passing through points $(1, 2)$ and $(3, 6)$.