

Evaluating and Simplifying Expressions Worksheet

To **evaluate** an algebraic expression means to **find its value** by replacing the variable with a given number and following the **order of operations (PEMDAS)**.

Order of Operations (PEMDAS):

1. **P**arentheses
2. **E**xponents
3. **M**ultiplication and **D**ivision (left to right)
4. **A**ddition and **S**ubtraction (left to right)

Simplifying Expressions

To **simplify** an expression means to **combine like terms**.

Like terms have the **same variable raised to the same power**.

Examples:

- $4x$ and $7x$ are like terms.
- $5y$ and $-2y$ are like terms.
- $3x$ and $3y$ are **not** like terms.

Example 1 – Evaluating an Expression

Evaluate:

Step 1. Substitute 4 for x .

$$3x + 5 \quad \text{when } x = 4$$

Step 2. Multiply.

$$3(4) + 5$$

Step 3. Add.

$$12 + 5$$

Answer: 17

Example 2 – Simplifying an Expression

Simplify: $5x + 3x - 2$

Step 1. Combine like terms.

$$5x + 3x = 8x$$

Answer

$$8x - 2$$

Part A – Evaluate the Expressions

Evaluate each expression using the given value.

1. $4x + 7$ when $x = 3$

Answer: _____

2. $6y - 5$ when $y = 8$

Answer: _____

3. $2n + 9$ when $n = 12$

Answer: _____

4. $5m - 11$ when $m = 9$

Answer: _____

5. $3a^2 + 1$ when $a = 4$

Answer: _____

6. $2b^2 - 7$ when $b = 6$

Answer: _____

7. $x^2 + 10$ when $x = 7$

Answer: _____

8. $5p + 2$ when $p = 11$

Answer: _____

9. $8k - 13$ when $k = 5$

Answer: _____

10. $4r^2 - 9$ when $r = 3$

Answer: _____

Part B – Simplify the Expressions - Combine like terms.

11. $3x + 5x$

12. $9y - 4y$

13. $6a + 8 - 2a$

14. $12m - 5 + 3m + 9$

15. $8n - 6n + 7$

16. $10p + 2 - 4p + 6$

17. $15x - 9x + 11$

18. $4y + 6 + 5y - 2$

19. $18a - 7a + 12 - 8$

20. $5m + 4m - 9 + 6$

Part C – Evaluate After Simplifying

Simplify and evaluate:

21. $4x + 6x - 3$ when $x = 2$

Simplify: _____ Evaluate: _____ Answer: _____

22. $7y - 2y + 8$ when $y = 6$

Simplify: _____ Evaluate: _____ Answer: _____

23. $9a - 4a + 5$ when $a = 3$

Simplify: _____ Evaluate: _____ Answer: _____

24. $8m + 2m - 7$ when $m = 5$

Simplify: _____ Evaluate: _____ Answer: _____

25. $12n - 5n + 9$ when $n = 4$

Simplify: _____ Evaluate: _____ Answer: _____

Part D – Word Problems

Write an expression and evaluate it.

26. A notebook costs **\$4**. You buy **$n$** notebooks. Evaluate when **$n = 7$** .

Expression: _____ Answer: _____ \$_____

27. A plumber charges **\$60** plus **\$25** per hour. Evaluate the total cost for **3 hours**.

Expression: _____ Answer: _____ \$_____

28. A movie ticket costs **\$12**. A popcorn costs **\$6**. You buy **$x$** tickets. Evaluate when **$x = 4$** .

Expression: _____ Answer: _____ \$_____

29. A gym charges **\$20** each month. Evaluate the cost for **$m = 9$** months.

Expression: _____ Answer: _____ \$_____

30. A taxi charges **\$5** plus **\$3** per mile. Evaluate the cost for **8 miles**.

Expression: _____ Answer: _____ \$_____
