

# Addition of Algebraic Expressions

## Unit: Algebraic Expressions - Student Practice Worksheet

**Overview:** Kabir added  $3x$  and  $5y$  and got ' $8xy$ .' Anaya said that was as wrong as adding 3 apples and 5 bananas to get 8 apple-bananas. Once he saw the fruit version, the algebra version stopped being a trick. You can only really combine things that are actually the same kind of thing.

### Practice Questions (30 Total)

#### Section A - Easy

**Q1.** Three teal x-tiles plus five maroon x-tiles. What is  $3x + 5x$ ?



- ☐ A.  $8x$
- ☐ B.  $15x$
- ☐ C.  $8x^2$
- ☐ D.  $2x$

**Q2.** Terms with the same letter and power are called:

- ☐ A. Unlike terms
- ☐ B. Coefficients
- ☐ C. Like terms
- ☐ D. Constants

**Q3.** Simplify:  $3x + 5y$ .

- ☐ A.  $8xy$
- ☐ B.  $3x + 5y$
- ☐ C.  $8x$
- ☐ D.  $15xy$

**Q4.** Six teal m-tiles from  $2m + 3m + m$ . What is the total?



$2m + 3m + m$

- ☐ A.  $6m$
- ☐ B.  $5m$
- ☐ C.  $6m^2$
- ☐ D.  $3m$

**Q5. In the term  $7a$ , the coefficient is:**

- ☐ A.  $a$
- ☐ B.  $7a$
- ☐ C.  $0$
- ☐ D.  $7$

**Q6. Simplify:  $4p + 2q$ .**

- ☐ A.  $6pq$
- ☐ B.  $4p + 2q$
- ☐ C.  $6p$
- ☐ D.  $8pq$

**Q7. Six teal y-tiles plus four maroon y-tiles. What is  $6y + 4y$ ?**



$6y + 4y$

- ☐ A.  $24y$
- ☐ B.  $2y$
- ☐ C.  $10y^2$
- ☐ D.  $10y$

**Q8. What is a 'term' in algebra?**

- ☐ A. One piece of an expression, like  $3x$  or  $7$
- ☐ B. An entire equation
- ☐ C. Only a number without a letter
- ☐ D. Only a letter without a number

**Q9. Can  $5a$  and  $5b$  be combined into one term?**

- ☐ A. Yes, into  $10ab$
- ☐ B. Yes, into  $10a$
- ☐ C. No, they are unlike terms
- ☐ D. Yes, into  $25ab$

**Q10. Simplify  $9x + x$ , then say why the invisible coefficient on  $x$  is 1.**

- ☐ A.  $9x$
- ☐ B.  $10x$
- ☐ C.  $9x^2$
- ☐ D.  $8x$

### Section B - Medium

**Q11. Six teal a-tiles and three maroon b-tiles. What is  $4a + 3b + 2a$ ?**



- ☐ A.  $6a + 3b$
- ☐ B.  $9ab$
- ☐ C.  $6a + 5b$
- ☐ D.  $4a + 5b$

**Q12. Why can constants (plain numbers) be added to each other but not to 'x' terms?**

- ☐ A. Constants can never be added to anything
- ☐ B. Because constants are always negative
- ☐ C. Constants are like terms among themselves only
- ☐ D. Because x-terms are always bigger

**Q13. Simplify:  $5p + 3q + 2p$ .**

- ☐ A.  $5p + 5q$
- ☐ B.  $7p + 3q$
- ☐ C.  $10pq$
- ☐ D.  $7p + 5q$

**Q14. Three x marks and two y marks. What is  $x+y+x+y+x$ ?**

x x x

y y

- ☐ A.  $3x + 2y$
- ☐ B.  $2x + 3y$
- ☐ C.  $5xy$
- ☐ D.  $3x + 3y$

**Q15. Simplify:  $6x + 2 + 4x + 5$ .**

- ☐ A.  $10x + 5$
- ☐ B.  $10x + 7$
- ☐ C.  $17x$
- ☐ D.  $12x$

**Q16. Simplify:  $3x + 4y + 2x + y$ .**

- ☐ A.  $6x + 5y$
- ☐ B.  $5x + 4y$
- ☐ C.  $5x + 5y$
- ☐ D.  $9xy$

**Q17. Eight teal a-tiles and ten maroon b-tiles. What is  $3a+4b+5a+6b$ ?**



- ☐ A.  $9a + 9b$
- ☐ B.  $8a + 9b$
- ☐ C.  $18ab$
- ☐ D.  $8a + 10b$

**Q18. Simplify:  $7m + 2n + 3m + 5n$ .**

- ☐ A.  $9m + 8n$
- ☐ B.  $10m + 5n$
- ☐ C.  $17mn$

☐ D.  $10m + 7n$

**Q19. Simplify:  $8a + 3 + 2a$ .**

☐ A.  $10a + 3$

☐ B.  $13a$

☐ C.  $10a$

☐ D.  $5a + 3$

**Q20. Simplify  $10p+4q+p+6q$ , grouping like letters.**

☐ A.  $10p + 10q$

☐ B.  $11p + 10q$

☐ C.  $14p + 6q$

☐ D.  $11p + 4q$

### Section C - Challenge

**Q21. Rectangle sides  $2x+3$  and  $x+1$ . Simplified perimeter of all four sides?**



☐ A.  $3x + 4$

☐ B.  $6x + 4$

☐ C.  $3x + 8$

☐ D.  $6x + 8$

**Q22. Kabir claims: 'x and  $x^2$  are like terms because they both have the letter x.' Is he right?**

☐ A. Yes, same letter is always enough

☐ B. No — the power matters too, and x has power 1 while  $x^2$  has power 2

☐ C. Only right if the coefficients match

☐ D. Only right for even powers

**Q23. Simplify:  $3x^2 + 5x + 2x^2 + x$ . ( $x^2$  means x squared, a different term from x.)**

☐ A.  $5x^2 + 6x$

☐ B.  $5x^2 + 5x$

- ☐ C.  $11x^2$
- ☐ D.  $6x^2 + 5x$

**Q24. Five teal x-tiles plus maroon k tiles make nine x. What is k?**



5 known x, rest k, total 9x

- ☐ A. 5
- ☐ B. 4
- ☐ C. 9
- ☐ D. 3

**Q25. Anaya says: 'The order you add like terms in never changes the final simplified answer.' Is this true?**

- ☐ A. No, order always changes the result
- ☐ B. Only true if all coefficients are positive
- ☐ C. Yes — addition of coefficients is commutative, same as ordinary number addition
- ☐ D. Only true for two terms, not three or more

**Q26. Simplify:  $2a + 3b + 4a + 5c + b$ .**

- ☐ A.  $6a + 3b + 5c$
- ☐ B.  $6a + 4b + 5c + b$
- ☐ C.  $6a + 4b + 5c$
- ☐ D.  $6a + 8bc$

**Q27. x-counts 2+4+6 and y-counts 3+5. What is  $2x+3y+4x+5y+6x$ ?**

x x + x x x x + x x x x x x

y y y + y y y y y

- ☐ A.  $11x + 8y$
- ☐ B.  $12x + 9y$
- ☐ C.  $20xy$
- ☐ D.  $12x + 8y$

**Q28. A term has no visible coefficient written, like just 'y'. What is its actual coefficient?**

- ☐ **A.** 1
- ☐ **B.** 0
- ☐ **C.** There is no coefficient
- ☐ **D.** It depends on the equation

**Q29. Simplify:  $5x + 3 + 2y + 4x + y + 7$ .**

- ☐ **A.**  $9x + 3y + 10$
- ☐ **B.**  $9x + 3y + 7$
- ☐ **C.**  $9xy + 10$
- ☐ **D.**  $9x + 2y + 10$

**Q30. Why do apples and bananas explain like vs unlike terms?**

- ☐ **A.** Because algebra is literally about fruit
- ☐ **B.** Different fruit can't merge into one count, like different letters
- ☐ **C.** Because apples and bananas are always the same price
- ☐ **D.** It doesn't really help explain anything

## Answer Key

**Q1:** (A) (a)  $8x$ . Like terms:  $3+5=8$ .

**Q2:** (C) (c) Like terms.

**Q3:** (B) (b)  $3x + 5y$ . Unlike terms cannot combine.

**Q4:** (A) (a)  $6m$ .  $2+3+1=6$ .

**Q5:** (D) (d) 7 — the number multiplying the letter.

**Q6:** (B) (b)  $4p + 2q$ . Unlike terms stay separate.

**Q7:** (D) (d)  $10y$ .  $6+4=10$ .

**Q8:** (A) (a) One piece of an expression, like  $3x$  or 7.

**Q9:** (C) (c) No — different letters means they cannot combine.

**Q10:** (B) (b)  $10x$ .  $x$  has an invisible coefficient of 1, so  $9+1=10$ .

**Q11:** (A) (a)  $6a + 3b$ . Group like terms:  $(4a+2a)+3b$ .

**Q12:** (C) (c) Constants form their own 'like terms' group among themselves, but a constant and a letter term are unlike each other.

**Q13:** (B) (b)  $7p + 3q$ . Group:  $(5p+2p)+3q$ .

**Q14:** (A) (a)  $3x + 2y$ . Count: three  $x$ 's, two  $y$ 's.

**Q15:** (B) (b)  $10x + 7$ . Group  $x$  terms ( $6x+4x=10x$ ) and constants ( $2+5=7$ ) separately.

**Q16:** (C) (c)  $5x + 5y$ . Group:  $(3x+2x)+(4y+y)$ .

**Q17:** (D) (d)  $8a + 10b$ . Group:  $(3a+5a)+(4b+6b)$ .

**Q18:** (D) (d)  $10m + 7n$ . Group:  $(7m+3m)+(2n+5n)$ .

**Q19:** (A) (a)  $10a + 3$ . The number 3 is a constant, not a like term with ' $a$ '.

**Q20:** (B) (b)  $11p + 10q$ . Group:  $(10p+p)+(4q+6q)$ .

**Q21:** (D) (d)  $6x + 8$ . Perimeter =  $2 \times (2x+3) + 2 \times (x+1) = (4x+6)+(2x+2) = 6x+8$ .

**Q22:** (B) (b) No — like terms need the SAME letter AND the same power;  $x$  (power 1) and  $x^2$  (power 2) are different terms.

**Q23:** (A) (a)  $5x^2 + 6x$ .  $x^2$  terms and  $x$  terms are unlike each other, so group separately:  $(3x^2+2x^2)+(5x+x)$ .

**Q24:** (B) (b) 4.  $3+2+k=9$ , so  $k=4$ .

**Q25:** (C) (c) Yes — adding the coefficients of like terms is just ordinary addition, which is commutative regardless of order.

**Q26:** (C) (c)  $6a + 4b + 5c$ . Group  $a$ 's ( $2a+4a=6a$ ),  $b$ 's ( $3b+b=4b$ ), leave  $c$  alone.

**Q27:** (D) (d)  $12x + 8y$ .  $x$ 's:  $2+4+6=12$ ;  $y$ 's:  $3+5=8$ .

**Q28:** (A) (a) 1 — a term with no visible number always has an implied coefficient of 1.

**Q29:** (A) (a)  $9x + 3y + 10$ . Group  $x$ 's ( $5x+4x=9x$ ),  $y$ 's ( $2y+y=3y$ ), constants ( $3+7=10$ ).

**Q30:** (B) (b) It makes concrete why genuinely different kinds of quantities can't be merged into one count — the same reasoning that keeps different-lettered terms from combining in algebra.

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