

Chapter 1 — Introduction to Algebra

Teacher Guide

Teacher Chapter-at-a-Glance

Materials

Student text, worksheets, pencils, colour-coded term cards or algebra tiles if available, highlighters for grouping like terms.

Pacing

Teach vocabulary and like terms before introducing distribution. Spend additional time on negative signs and subtraction phrases, as these ideas recur throughout the course.

Talk Prompt

“What makes two terms alike? Is it enough that both terms have a number and a letter?”

If Ready-to-Learn Reveals a Gap

If students struggle with signed multiplication or BEDMAS, provide a short prerequisite review before negative brackets are introduced. If students read $3x$ as a two-digit number, reinforce multiplication notation with repeated-groups models.

Mastery Decision Guide

What a missed Tripwire item actually means, and what to do about it before moving on.

Missed Tripwire #1 → Combining unlike terms (Mistake 1). *Student writes $8xy$.* Review before the next chapter.

Missed Tripwire #2 → Losing a negative sign (Mistake 3). *Student writes $13m$ or $-3a-6$.* Review before the next chapter.

Ready-to-Learn Check

Quick check before starting. A wrong answer below points to a specific gap worth closing first, not just a miss to shrug off.

1. Integer addition. Calculate: $-8+13$

Correct answer: 5

Likely wrong answer: -21

Misconception: The student may be adding the absolute values and keeping the negative sign instead of recognizing that the numbers have different signs.

Next move: Review integer addition with a number line or by comparing the positive and negative amounts before continuing.

2. Multiplication with a negative factor. Calculate: $-4(6)$

Correct answer: -24

Likely wrong answer: 24

Misconception: The student may know that $4 \times 6 = 24$ but may not yet apply the sign rule for one negative factor.

Next move: Review that one negative factor produces a negative product. This will matter when brackets are expanded later in the chapter.

3. Numerical order of operations. Calculate: $7+3(5)$

Correct answer: 22

Likely wrong answer: 50

Misconception: The student may be adding $7+3$ before multiplying, rather than following BEDMAS.

Next move: Review that multiplication is completed before addition when no brackets change the order.

4. Multiplication written beside a symbol. Write the following product without a multiplication dot: $6 \cdot n$

Correct answer: $6n$

Likely wrong answer: $6+n$

Misconception: The student may interpret adjacent symbols as addition instead of multiplication.

Next move: Review that a number written beside a variable means multiplication. In algebra, $6n$ means $6 \times n$.

Common Mistakes

Students often run into the same kinds of trouble with this topic. Recognizing these patterns helps avoid them.

Negative Bracket Sign Flip

$$-(2x + 3) = -1(2x + 3)$$

Inside term	Multiply by -1	Result
$2x$	$-1 \times 2x$	$-2x$
$+3$	-1×3	-3

$$-(2x + 3) = -2x - 3$$

Mistake 1: Combining unlike terms

What students do: $6x + 2y = 8xy$

Why this happens: The student sees two terms and assumes that all terms in an expression can be combined.

What to do instead: Compare the variable parts before combining. $6x$ and $2y$ represent different quantities, so the expression remains $6x + 2y$.

Diagnostic trigger: Student writes $8xy$.

Mistake 2: Forgetting the implied coefficient of 1

What students do: $8x - x = 8x$

Why this happens: The coefficient 1 is not visible, so the student may overlook it.

What to do instead: Read x as $1x$: $8x - x = 8x - 1x = 7x$.

Diagnostic trigger: Student writes $8x$ or 7 .

Mistake 3: Losing a negative sign

What students do: $9m - 4m = 13m$ or $-3(a - 2) = -3a - 6$

Why this happens: The student does not keep the negative sign attached to the term, or applies the negative factor inconsistently.

What to do instead: Treat subtraction as adding a negative term, and distribute a negative factor to every term: $9m+(-4m)=5m$; $-3(a-2)=-3a+6$.

Diagnostic trigger: Student writes $13m$ or $-3a-6$.

Mistake 4: Reversing “less than” phrases

What students do: Translates “8 less than n ” as $8-n$

Why this happens: The student translates the words in the order they appear rather than identifying which quantity is being reduced.

What to do instead: Begin with the quantity after “less than,” then subtract: $n-8$.

Diagnostic trigger: Student writes $8-n$ for “8 less than n .”

Practice

TEACHING NOTE

Practice items are grouped by skill (A-D) so a teacher can assign a subset for targeted review rather than the full set.

Teacher solutions follow this practice set.

1. A. Algebraic Structure

2. Identify the terms, coefficients, and constant in: $-6x+11y-13$ (Hint: keep each operation sign attached to the term that follows it.)
3. State whether the following is an expression or an equation, and explain how the equals sign affects your decision: $8p-5=3p+20$
4. Are the following terms like terms? Explain how you know: $-7ab$ and $4a$ (Hint: compare every part of the variable portion, not only the first letter.)

5. B. Simplifying Expressions

6. Simplify: $12k-5k+9$ (Hint: combine the k -terms before deciding what happens to the constant.)
7. Simplify: $3m+8n-6m+2n$ (Hint: group terms with matching variable parts.)
8. Simplify: $-4r+15-r-9$ (Hint: a variable written alone has an implied coefficient of 1.)
9. A student simplifies $7x+4$ as $11x$. Is the student correct? Explain. (Hint: ask whether $7x$ and 4 represent the same kind of term.)

10. C. Expanding Brackets

11. Expand and simplify: $3(4a+5)$ (Hint: the factor 3 must multiply both terms inside the brackets.)
12. Expand and simplify: $-2(5b-7)$ (Hint: write the two products separately before deciding each sign.)
13. A student expands $2(3c-4)$ as $6c-4$. Identify the wrong move and write the correct expansion. (Hint: check whether 2 was multiplied by both terms.)
- ## 14. D. Writing Expressions
15. Write an algebraic expression for: nine more than twice a number g (Hint: begin with twice the number, then add 9.)
16. A local gym charges a \$30 registration fee and \$12 for each class package purchased. Write an algebraic expression for the total cost of p class packages. (Hint: one amount is paid once, while the other amount changes with p .)

Practice Solutions

Use these concise solutions to check the method as well as the final answer.

2. Identify the terms, coefficients, and constant in: $-6x+11y-13$ (Hint: keep each operation sign attached to the term that follows it.)
Solution: Keep each sign with its term: terms $-6x$, $11y$, -13 ; coefficients -6 and 11 ; constant -13 .
3. State whether the following is an expression or an equation, and explain how the equals sign affects your decision: $8p-5=3p+20$
Solution: It is an equation because the equals sign states that $8p - 5$ and $3p + 20$ are equal.
4. Are the following terms like terms? Explain how you know: $-7ab$ and $4a$ (Hint: compare every part of the variable portion, not only the first letter.)
Solution: No. The variable parts are ab and a , so the terms are not like terms.
6. Simplify: $12k-5k+9$ (Hint: combine the k -terms before deciding what happens to the constant.)
Solution: $12k - 5k + 9 = (12 - 5)k + 9 = 7k + 9$.
7. Simplify: $3m+8n-6m+2n$ (Hint: group terms with matching variable parts.)
Solution: $3m + 8n - 6m + 2n = (3 - 6)m + (8 + 2)n = -3m + 10n$.

8. Simplify: $-4r+15-r-9$ (Hint: a variable written alone has an implied coefficient of 1.)

Solution: $-4r + 15 - r - 9 = (-4 - 1)r + (15 - 9) = -5r + 6$.

9. A student simplifies $7x+4$ as $11x$. Is the student correct? Explain. (Hint: ask whether $7x$ and 4 represent the same kind of term.)

Solution: No. $7x$ and 4 are unlike terms, so the expression remains $7x + 4$.

11. Expand and simplify: $3(4a+5)$ (Hint: the factor 3 must multiply both terms inside the brackets.)

Solution: Distribute 3 to both terms: $3(4a + 5) = 12a + 15$.

12. Expand and simplify: $-2(5b-7)$ (Hint: write the two products separately before deciding each sign.)

Solution: Distribute -2 to both terms: $-2(5b - 7) = -10b + 14$.

13. A student expands $2(3c-4)$ as $6c-4$. Identify the wrong move and write the correct expansion. (Hint: check whether 2 was multiplied by both terms.)

Solution: The factor 2 was not applied to -4 . The correct expansion is $2(3c - 4) = 6c - 8$.

15. Write an algebraic expression for: nine more than twice a number g (Hint: begin with twice the number, then add 9 .)

Solution: Twice g is $2g$; nine more gives $2g + 9$.

16. A local gym charges a \$30 registration fee and \$12 for each class package purchased. Write an algebraic expression for the total cost of p class packages. (Hint: one amount is paid once, while the other amount changes with p .)

Solution: The fixed fee is 30 and the variable cost is $12p$, so the total is $30 + 12p$ dollars.

Tripwire Check

These questions test whether the thinking is solid — not just whether the procedure was memorized. Each wrong answer below points to a specific misconception, not just "try again."

1. Can These Terms Combine? A student simplifies the expression below as shown:

$5x+2x^2=7x^3$. Is the student correct? Explain how the exponents affect the decision about whether the terms can be combined.

Correct answer: The student is not correct. $5x$ and $2x^2$ are not like terms because the exponent on x is different. The expression cannot be simplified by combining the terms: $5x+2x^2$.

Likely wrong answer: $7x^3$

Misconception: The student may be adding coefficients and exponents when adding terms, confusing addition of like terms with multiplication of powers.

Next move: Return to the definition of like terms. Compare the variable part, including the exponent, before combining any terms.

2. What Does the Negative Sign Distribute To? A student expands the expression below:
 $-2(3n-4)$ and writes: $-6n-8$. Identify the wrong move and write the corrected expansion.

Correct answer: The wrong move occurs when multiplying -2 by -4 . The product of two negative numbers is positive: $-2(3n-4)=-6n+8$.

Likely wrong answer: $-6n-8$

Misconception: The student may distribute the negative factor to both terms but not apply the sign rule for multiplying two negative numbers.

Next move: Rewrite the distribution as two separate products, $-2(3n)+(-2)(-4)$, then calculate each product before combining anything.

Answer Key — Worksheets (Full Diagnostic)

Worksheet A: Guided Practice

1. Identify the variable in: $8m+3$

1. m Likely wrong answer: 8 (names the coefficient, not the variable). Misconception: The number attached to the letter is read as the answer instead of the letter itself.

2. Identify the constant in: $-6n-15$

2. -15 Likely wrong answer: 15 (drops the constant's own sign). Misconception: A term's negative sign is lost when it is read out of a subtraction.

3. Identify the coefficient of p in: $12p-7$

3. 12 Likely wrong answer: -7 , or $12p$ (names the constant, or includes the variable). Misconception: Coefficient is confused with constant, or not separated from the full term.

4. Simplify: $7a+4a$

4. $11a$ Likely wrong answer: $11a^2$ (multiplies the variables together). Misconception: 'Combine like terms' is treated as an instruction to multiply, not add the coefficients.

5. How many terms are in: $4x-9y+6$

5. 3 terms Likely wrong answer: 2 terms (misses the constant as a term). Misconception: A bare number at the end is not recognized as its own term.

6. Simplify: $13b-8b$

6. $5b$ Likely wrong answer: $21b$ (adds instead of subtracting). Misconception: Subtraction between like-term coefficients is treated as addition.

7. Are the following like terms? $6q$ and $-2q$

7. Yes. Both terms have variable part q . Likely wrong answer: No (says they're unlike because one is negative). Misconception: A difference in sign is mistaken for a difference in variable part.

8. Simplify: $5c+2-3c$

8. $2c+2$ Likely wrong answer: $4c$ (folds the constant into the coefficient total). Misconception: The constant is not separated from the c -terms before combining.

9. Expand: $7(2x)$

9. $14x$ Likely wrong answer: $9x$ (adds 7 and 2 instead of multiplying). Misconception: A number beside a bracket with no symbol shown is read as addition, not multiplication.

10. Write an algebraic expression for: a number t increased by 14

10. $t+14$ Likely wrong answer: $14t$ (multiplies instead of adds). Misconception: 'Increased by' is misread as a scaling word rather than an addition word.

11. Are the following like terms? $4h$ and $4h^2$

11. No. One term has h ; the other has h^2 . Likely wrong answer: Yes (matches on the letter h alone). Misconception: The exponent is not treated as part of what defines the variable part.

12. Is the following an expression or an equation? $3r+11$

12. Expression Likely wrong answer: Equation. Misconception: Any string containing a variable is assumed to be an equation, regardless of an equals sign.

13. Is the following an expression or an equation? $9k-5=22$

13. Equation Likely wrong answer: Expression (overlooks the equals sign).
Misconception: Only part of the statement is checked, missing the equals sign entirely.

14. Simplify: $9d-4+d+10$

14. $10d+6$ Likely wrong answer: $9d+6$ (drops the bare d). Misconception: A bare variable is treated as contributing nothing, instead of counting as $1d$.

15. Expand and simplify: $5(y-2)$

15. $5y-10$ Likely wrong answer: $5y-2$ (multiplies only the first term inside the bracket).
Misconception: The multiplier is applied to only part of the bracket's contents.

16. Write an algebraic expression for: a number w divided by 4

16. $w/4$ Likely wrong answer: $4/w$ or $4w$ (reverses the order, or multiplies).
Misconception: The translation direction for 'divided by' is reversed, or the operation itself is swapped.

Worksheet B: Independent Practice

1. Expand and simplify: $7(a+3)$

1. $7a+21$ Likely wrong answer: $7a+3$ (multiplies only the first term). Misconception: The multiplier is not distributed to every term in the bracket.

2. Simplify: $15r-6r+8$

2. $9r+8$ Likely wrong answer: $21r+8$ (adds instead of subtracting the coefficients).
Misconception: Subtraction between like-term coefficients is treated as addition.

3. Expand and simplify: $2(4b-9)$

3. $8b-18$ Likely wrong answer: $8b-9$ (distributes to the first term only). Misconception: The multiplier is not applied to the second term inside the bracket.

4. Simplify: $2s+13-9s-5$

4. $-7s+8$ Likely wrong answer: $11s+8$ (combines coefficient magnitudes instead of their signed values). Misconception: The negative sign on a term is dropped when regrouping like terms.

5. Expand and simplify: $-5(c-6)$

5. $-5c+30$ Likely wrong answer: $-5c-30$ (drops the double-negative). Misconception: A negative multiplied by a negative is still read as negative.

6. Simplify: $-4x+6+7x-11$

6. $3x-5$ Likely wrong answer: $11x-5$ (adds $|-4|$ and 7 instead of finding their signed sum). Misconception: A negative coefficient's sign is dropped when combined with a positive one.

7. Expand and simplify: $-2(3d+8)$

7. $-6d-16$ Likely wrong answer: $-6d+16$ (mishandles the sign on the second term). Misconception: Only the first term's sign is tracked correctly when distributing a negative multiplier.

8. Write an algebraic expression for: the product of 8 and a number n, decreased by 6

8. $8n-6$ Likely wrong answer: $8(n-6)$ (applies 'decreased by' inside the product). Misconception: The second operation in the sentence is applied to the wrong part of the expression.

9. Identify the variables, coefficients, and constant in: $-9a+4b+16$

9. Variables: a, b; coefficients: -9, 4; constant: 16 Likely wrong answer: coefficients 9, 4 (drops the negative sign on the first coefficient). Misconception: A coefficient's sign is separated from its value when it is listed on its own.

10. Simplify: $3m-8n+5m+2n$

10. $8m-6n$ Likely wrong answer: $8m+6n$ (adds magnitudes instead of combining signed coefficients for n). Misconception: Unlike-signed coefficients are combined by adding their sizes rather than their signed values.

11. Expand and simplify: $4(2x-1)+3x$

11. $11x-4$ Likely wrong answer: $11x-1$ (multiplies the variable term by 4 but not the constant). Misconception: The multiplier is applied to only the variable term inside the bracket.

12. Write an algebraic expression for: five more than twice a number w

12. $2w+5$ Likely wrong answer: $5w+2$ (reverses which number scales w and which is added). Misconception: Word order is read left to right instead of identifying what each phrase describes.

13. A music subscription charges a \$9 monthly fee and \$3 for each downloaded album a. Write an expression for the cost.

13. $9+3a$ dollars Likely wrong answer: $3+9a$ (swaps the fixed fee and the per-unit rate). Misconception: The roles of the flat fee and the rate per item are reversed.

14. Write the terms in: $7x-3y-10$

14. $7x$, $-3y$, -10 Likely wrong answer: $7x$, $3y$, 10 (drops all the signs). Misconception: A term's sign is treated as separate from the term rather than part of it.

15. Classify the following as an expression or an equation: $4m+9=3m-2$

15. Equation Likely wrong answer: Expression. Misconception: Variables on both sides of a statement are mistaken for a single expression rather than a claim of equality.

16. Simplify: $12p-5+p-14$

16. $13p-19$ Likely wrong answer: $12p-19$ (drops the bare p). Misconception: A bare variable term is not included when combining like terms.

17. Expand and simplify: $3(y+5)-2y$

17. $y+15$ Likely wrong answer: $3y+5-2y=y+5$ (multiplies only the variable term inside the bracket). Misconception: The constant inside the bracket is not multiplied along with the variable term.

18. Write an algebraic expression for: the difference between 30 and four times a number k

18. $30-4k$ Likely wrong answer: $4k-30$ (reverses the order of subtraction). Misconception: 'Difference between A and B' is translated as B minus A instead of A minus B.

19. A square has side length $n+2$ centimetres. Write and simplify an expression for its perimeter.

19. $4n+8$ cm Likely wrong answer: $4n+2$ (multiplies only the variable part of the side length by 4). Misconception: The constant part of the side length is not carried through all four sides.

20. A student says: $-3x+7x=-10x$. Explain the error and write the correct simplified expression.

20. The coefficients should be added: $-3+7=4$. The correct answer is $4x$. Likely wrong answer: $-10x$. Misconception: The coefficients' magnitudes are added and the first term's sign is kept, instead of finding the net signed sum.

Worksheet C: Mixed Application

1. Expand and simplify: $8(p-2)$

1. $8p-16$ Likely wrong answer: $8p-2$ (distributes to the first term only). Misconception: The multiplier is not applied to the second term inside the bracket.

2. Expand and simplify: $-6(q+4)$

2. $-6q-24$ Likely wrong answer: $-6q+24$ (mishandles the sign on the second term). Misconception: Only the first term's sign is tracked correctly when distributing a negative multiplier.

3. Write an algebraic expression for: the total of a \$25 membership fee and \$4 for each visit v

3. $25+4v$ dollars Likely wrong answer: $4+25v$ (swaps the fixed fee and the per-visit rate). Misconception: The roles of the flat fee and the rate per visit are reversed.

4. Simplify: $14m-3+2m-12$

4. $16m-15$ Likely wrong answer: $16m+9$ (adds the two constants instead of subtracting). Misconception: Signed constants are combined by adding magnitudes rather than their signed values.

5. Expand and simplify: $5(2r-3)-r$

5. $9r-15$ Likely wrong answer: $10r-15$ (drops the $-r$ term, treating it as having no coefficient). Misconception: A bare negative variable term is not counted as -1 times the variable.

6. A garden is shaped like a rectangle. Its length is $2x+3$ metres, and its width is $x-1$ metres. Write and simplify an expression for the perimeter.

6. $6x+4$ m Likely wrong answer: $3x+2$ m (adds length and width once instead of doubling both for perimeter). Misconception: Perimeter is built from one length and one width instead of two of each.

7. Identify the coefficient of x , the coefficient of y , and the constant in: $5x-2y+18$

7. Coefficient of x : 5; coefficient of y : -2; constant: 18 Likely wrong answer: coefficient of y is 2 (drops the negative sign). Misconception: A coefficient's sign is separated from its value when it is named on its own.

8. Simplify: $6a+9b-4a-3b$

8. $2a+6b$ Likely wrong answer: $2a+3b$ (combines $9b$ and $-3b$ by adding magnitudes, $9-3$ read as 3 not 6). Misconception: Like-term coefficients are combined incorrectly when both terms are positive-looking but one is being subtracted.

9. Expand and simplify: $-3(4s-1)+2s$

9. $-10s+3$ Likely wrong answer: $-12s-1+2s=-10s-1$ (mishandles the constant's sign after distributing). Misconception: Distributing a negative multiplier across a negative constant produces a sign the student does not expect and is corrected to match the first term instead.

10. Write an algebraic expression for: eleven less than six times a number j

10. $6j-11$ Likely wrong answer: $11-6j$ (reverses the order of the subtraction). Misconception: 'Less than' is translated in the order the words appear rather than reversed.

11. A triangle has side lengths $3n+1$, $n+5$, and $2n-4$ centimetres. Write and simplify an expression for its perimeter.

11. $6n+2$ cm Likely wrong answer: $6n+2$ written as $5n+2$ (drops one of the n -terms when adding three terms instead of two). Misconception: Combining three like terms at once is treated the same as combining two, and one term is missed.

12. A student writes: $4x+6=10x$. Explain whether the student is correct.

12. The student is incorrect. $4x$ and 6 are unlike terms, so the expression remains $4x+6$. Likely wrong answer: correct. Misconception: Unlike terms (a variable term and a constant) are treated as combinable because they appear on the same side.

13. A student expands: $-4(2y-3)$ as $-8y-12$. Identify the wrong move and write the correct expansion.

13. The correct expansion is $-8y+12$. Two negative factors produce a positive product. Likely wrong answer: $-8y-12$. Misconception: Two negative factors are multiplied and the result is kept negative instead of becoming positive.

14. Non-Routine: A student is organizing a school event. Renting equipment costs \$40. Each table costs \$6 to rent. Write an expression for the total cost of renting t tables. Then explain what the fixed number and the variable term represent.

14. Correct answer: $40+6t$. The 40 represents the one-time equipment rental cost. The term $6t$ represents the \$6 cost for each of t tables. Likely wrong answer: $46t$
Misconception: The student may be combining a fixed cost and a per-table cost as if both amounts change with the number of tables. Next move: Separate the amount paid once from the amount that is repeated for each table.

15. Non-Routine: A student says that the expression $4(2x+3)-5x$ cannot be simplified because it contains both brackets and unlike terms. Is the student correct? Explain what can be simplified and what cannot, then write the expression in simplified form.

15. Correct answer: The student is not correct. Expanding first gives $8x+12-5x$, and $8x$ and $-5x$ are like terms, so the expression simplifies to $3x+12$. Likely wrong answer: $8x+12-5x$ (left unsimplified) Misconception: The student may distribute correctly but not scan the expanded expression again for like terms. Next move: After expanding brackets, check the entire expression again for terms with matching variable parts. Simplifying can happen in stages.

Answer Key — Exit Ticket

1. Coefficient: -8 ; constant: 17
2. $13g+3$
3. $-10x+15$

Worksheet 1: Guided Practice

1. m
2. -15
3. 12
4. $11a$
5. 3 terms
6. $5b$
7. Yes. Both terms have variable part q .
8. $2c+2$
9. $14x$
10. $t+14$
11. No. One term has h ; the other has h^2 .
12. Expression
13. Equation
14. $10d+6$
15. $5y-10$
16. $w/4$

Worksheet 2: Independent Practice

1. $7a+21$
2. $9r+8$
3. $8b-18$
4. $-7s+8$
5. $-5c+30$
6. $3x-5$
7. $-6d-16$
8. $8n-6$
9. Variables: a, b ; coefficients: $-9, 4$; constant: 16
10. $8m-6n$
11. $11x-4$
12. $2w+5$
13. $9+3a$ dollars
14. $7x, -3y, -10$

15. Equation
16. $13p-19$
17. $y+15$
18. $30-4k$
19. $4n+8$ cm
20. The coefficients should be added: $-3+7=4$. The correct answer is $4x$.

Worksheet 3: Mixed Practice & Application

Item 14 (Non-Routine)

Correct answer: $40+6t$. The 40 represents the one-time equipment rental cost. The term $6t$ represents the \$6 cost for each of t tables.

Likely wrong answer: $46t$

Misconception: The student may be combining a fixed cost and a per-table cost as if both amounts change with the number of tables.

Next move: Separate the amount paid once from the amount that is repeated for each table.

Item 15 (Non-Routine)

Correct answer: The student is not correct. Expanding first gives $8x+12-5x$, and $8x$ and $-5x$ are like terms, so the expression simplifies to $3x+12$.

Likely wrong answer: $8x+12-5x$ (left unsimplified)

Misconception: The student may distribute correctly but not scan the expanded expression again for like terms.

Next move: After expanding brackets, check the entire expression again for terms with matching variable parts. Simplifying can happen in stages.

1. $8p-16$
2. $-6q-24$
3. $25+4v$ dollars
4. $16m-15$
5. $9r-15$
6. $6x+4$ m
7. Coefficient of x : 5; coefficient of y : -2; constant: 18
8. $2a+6b$
9. $-10s+3$
10. $6j-11$
11. $6n+2$ cm
12. The student is incorrect. $4x$ and 6 are unlike terms, so the expression remains $4x+6$.

13. The correct expansion is $-8y+12$. Two negative factors produce a positive product.
14. (see diagnostic above)
15. (see diagnostic above)