

Chapter 4 — Solving Two-Step and Multi-Step Equations

Teacher Guide

Teacher Chapter-at-a-Glance

Materials

Student text, worksheets, pencils, highlighters, optional balance-scale visual, optional algebra tiles or counters.

Pacing

Teach two-step equations before brackets. Teach brackets and simplifying before variables on both sides. Introduce no-solution and infinitely-many-solutions cases only after students have reliable balance habits.

Talk Prompt

“Which operation happened last to the variable, and what operation will undo it without changing the balance?”

If Ready-to-Learn Reveals a Gap

If students cannot solve a one-step equation or apply signed-number operations accurately, reteach Chapter 3 before moving forward. If students cannot combine like terms or distribute correctly, revisit Chapter 1 before variables-on-both-sides or bracket equations.

Mastery Decision Guide

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

Missed Tripwire #1 → Ignoring brackets or distributing to one term only (Mistake 2). *Student writes $2x-4$ for $2(x-4)$.* Review before the next chapter.

Missed Tripwire #2 → Misreading a true or false statement after variables disappear (Mistake 4). *Student gives a numerical value after the variable has disappeared.* 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. Solve a one-step equation. $x+7=15$

Correct answer: $x=8$

Likely wrong answer: $x=22$

Misconception: The student may add 7 instead of using subtraction to undo the addition.

Next move: Review inverse operations. Addition is undone by subtraction.

2. Combine like terms. $3x+5x-4$

Correct answer: $8x-4$

Likely wrong answer: $8x^2-4$

Misconception: The student may add exponents when adding like terms.

Next move: Review that like terms are combined by adding or subtracting coefficients. The variable part remains unchanged.

3. Distribute a factor. $4(x-3)$

Correct answer: $4x-12$

Likely wrong answer: $4x-3$

Misconception: The student may multiply the first term but not the second term inside brackets.

Next move: Rewrite the expression as two products: $4(x)+4(-3)$.

4. Check a proposed solution. Is $x=5$ a solution to $3x+2=17$? Show the check.

Correct answer: $3(5)+2=17$; $17=17$. Yes.

Likely wrong answer: No, because $5\neq 17$.

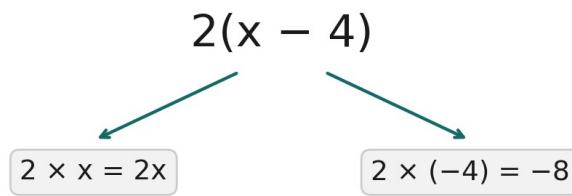
Misconception: The student may compare the proposed value directly to the total rather than substituting it.

Next move: Review that a solution must make the complete original equation true.

Common Mistakes

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

Distribution Means Every Term



$$2(x - 4) = 2x - 8$$

Not $2x - 4$

Mistake 1: Undoing operations in the wrong order

What students do: Solving $3x+5=20$ by dividing by 3 first.

Why this happens: The student sees the coefficient 3 and tries to divide immediately, even though 5 was added after multiplication.

What to do instead: Undo operations in reverse order. First subtract 5, then divide by 3.

Diagnostic trigger: Student divides by the coefficient before removing the added or subtracted constant.

Mistake 2: Ignoring brackets or distributing to one term only

What students do: Writing $2(x-4)=2x-4$

Why this happens: The student multiplies the first term in the bracket but overlooks the second term.

What to do instead: Multiply the outside factor by every term: $2(x-4)=2x-8$.

Diagnostic trigger: Student writes $2x-4$ for $2(x-4)$.

Mistake 3: Moving a term without preserving balance

What students do: Rewriting $5x+4=3x+16$ as $5x-3x=16-4$ without showing the matching operations.

Why this happens: The student may remember “move it across the equals sign” but may not understand the balance operation that makes the sign change valid.

What to do instead: Write the same operation on both sides before simplifying.

***Diagnostic trigger:** A term changes sides with a changed sign but no matching operation is shown on both sides.*

Mistake 4: Misreading a true or false statement after variables disappear

What students do: Reaching $5=5$ and writing $x=5$, or reaching $-2=7$ and continuing to solve.

Why this happens: The student expects every equation to produce one numerical value for the variable.

What to do instead: A true statement means infinitely many solutions. A false statement means no solution.

***Diagnostic trigger:** Student gives a numerical value after the variable has disappeared.*

Practice

TEACHING NOTE

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

Teacher solutions follow this practice set.

1. A. Two-Step Equations

2. Solve: $2x+7=19$ (Hint: subtract 7 first, then divide by 2.)

3. Solve: $5n-4=21$ (Hint: add 4 first.)

4. Solve: $m \div 3 + 6 = 11$ (Hint: subtract 6 first, then multiply by 3.)

5. Solve: $8-2k=18$ (Hint: subtract 8 first, then divide by -2.)

6. B. Simplify First

7. Solve: $3(x+2)=21$ (Hint: divide by 3 first or distribute correctly.)

8. Solve: $2(2y-5)=14$ (Hint: the 2 multiplies both terms inside the bracket.)

9. Solve: $4x+3-2x=17$ (Hint: combine like terms before using inverse operations.)

10. Solve: $5-3x+x=13$ (Hint: combine the x-terms first.)

11. C. Variables on Both Sides and Special Cases

12. Solve: $6x-5=2x+19$ (Hint: collect the variable terms on one side before removing constants.)
13. Solve: $7m+3=4m-12$ (Hint: subtract $4m$ from both sides first.)
14. Determine the number of solutions: $4p+8=4p+8$ (Hint: what happens after the variable terms are removed?)
15. Determine the number of solutions: $3q-6=3q+2$ (Hint: what does a false statement mean after the variable disappears?)

Practice Solutions

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

2. Solve: $2x+7=19$ (Hint: subtract 7 first, then divide by 2.)
Solution: $2x + 7 = 19$; $2x = 12$; $x = 6$.
3. Solve: $5n-4=21$ (Hint: add 4 first.)
Solution: $5n - 4 = 21$; $5n = 25$; $n = 5$.
4. Solve: $m \div 3 + 6 = 11$ (Hint: subtract 6 first, then multiply by 3.)
Solution: $m \div 3 + 6 = 11$; $m \div 3 = 5$; $m = 15$.
5. Solve: $8-2k=18$ (Hint: subtract 8 first, then divide by -2.)
Solution: $8 - 2k = 18$; $-2k = 10$; $k = -5$.
7. Solve: $3(x+2)=21$ (Hint: divide by 3 first or distribute correctly.)
Solution: $3(x + 2) = 21$; $x + 2 = 7$; $x = 5$.
8. Solve: $2(2y-5)=14$ (Hint: the 2 multiplies both terms inside the bracket.)
Solution: $2(2y - 5) = 14$; $4y - 10 = 14$; $4y = 24$; $y = 6$.
9. Solve: $4x+3-2x=17$ (Hint: combine like terms before using inverse operations.)
Solution: $4x + 3 - 2x = 17$; $2x + 3 = 17$; $2x = 14$; $x = 7$.
10. Solve: $5-3x+x=13$ (Hint: combine the x-terms first.)
Solution: $5 - 3x + x = 13$; $5 - 2x = 13$; $-2x = 8$; $x = -4$.
12. Solve: $6x-5=2x+19$ (Hint: collect the variable terms on one side before removing constants.)
Solution: $6x - 5 = 2x + 19$; $4x = 24$; $x = 6$.
13. Solve: $7m+3=4m-12$ (Hint: subtract $4m$ from both sides first.)
Solution: $7m + 3 = 4m - 12$; $3m = -15$; $m = -5$.

14. Determine the number of solutions: $4p+8=4p+8$ (Hint: what happens after the variable terms are removed?)

Solution: Subtracting $4p$ gives $8 = 8$, which is always true. There are infinitely many solutions.

15. Determine the number of solutions: $3q-6=3q+2$ (Hint: what does a false statement mean after the variable disappears?)

Solution: Subtracting $3q$ gives $-6 = 2$, which is false. There is no solution.

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. Did Every Term Receive the Factor? A student solves $2(x-4)=10$ and writes: $2x-4=10$, $2x=14$, $x=7$. Is the student correct? Identify the wrong move, solve the equation correctly, and check the answer.

Correct answer: The factor 2 must multiply both terms. $2x-8=10$, so $2x=18$ and $x=9$. Check: $2(9-4)=10$.

Likely wrong answer: $x=7$

Misconception: The student may distribute to the variable term but not to the constant term.

Next move: Rewrite the left side as $2(x)+2(-4)$ before solving.

2. What Does It Mean When the Variable Disappears? A student solves $5x+2=5x-3$ and writes $2=-3$. The student then says $x=-3$. Is the student correct? Explain what the statement $2=-3$ means for the original equation.

Correct answer: The student is not correct. $2=-3$ is false, so no value of x can make the original equation true. The equation has no solution.

Likely wrong answer: $x=-3$

Misconception: The student may assume every equation must end with a numerical value for x .

Next move: Compare a true statement such as $4=4$ with a false statement such as $2=-3$.

Answer Key — Worksheets (Full Diagnostic)

Worksheet A: Guided Practice

1. Solve: $3n-4=11$

1. $n=5$ Likely wrong answer: $n=25/3$ (divides by 3 before adding 4). Misconception: The operations are undone in the order they were applied instead of reverse order.

2. Solve: $7-2k=15$

2. $k=-4$ Likely wrong answer: $k=4$ (drops the negative sign when dividing by -2). Misconception: The negative coefficient's sign is not carried through the final division.

3. Solve: $m \div 2 + 3 = 9$

3. $m=12$ Likely wrong answer: $m=24$ (multiplies by 2 before subtracting 3). Misconception: The operations are undone in the order they were applied instead of reverse order.

4. Solve: $4(x+1)=20$

4. $x=4$ Likely wrong answer: $x=1$ (distributes the 4 first, then mishandles the constant). Misconception: Distributing before dividing introduces an extra step where the constant is mismanaged.

5. Solve: $2a+5a-4=17$

5. $a=3$ Likely wrong answer: $a=21$ (adds $2a$ and $5a$ incorrectly, or skips combining before solving). Misconception: Like terms are not combined before the equation is solved, leading to the wrong coefficient.

6. Solve: $5x+6=2x+18$

6. $x=4$ Likely wrong answer: $x=-4$ (subtracts $5x$ from both sides instead of $2x$). Misconception: The smaller variable term is not the one chosen to eliminate, leading to a sign error.

7. Determine the number of solutions: $2p+7=2p+7$

7. Infinitely many solutions Likely wrong answer: No solution (mistakes a true statement for a false one). Misconception: A statement that is always true is read as a contradiction rather than as infinitely many solutions.

8. Solve: $2x+5=17$

8. $x=6$ Likely wrong answer: $x=11$ (divides by 2 before subtracting 5). Misconception: The operations are undone in the order they were applied instead of reverse order.

9. Solve and check: $5-3r=-7$

9. $r=4$ Likely wrong answer: $r=-4$ (drops the negative sign when dividing by -3).
Misconception: The negative coefficient's sign is not carried through the final division.

10. Solve and check: $s \div (-4) - 2 = 5$

10. $s=-28$ Likely wrong answer: $s=-12$ (multiplies by -4 before adding 2). Misconception: The operations are undone in the order they were applied instead of reverse order.

11. Solve: $3(y-2)=18$

11. $y=8$ Likely wrong answer: $y=4$ (adds 2 before dividing by 3). Misconception: The operations are undone in the order they were applied instead of reverse order.

12. Solve: $9-4b+b=24$

12. $b=-5$ Likely wrong answer: $b=5$ (combines $-4b$ and b as $-4b$ instead of $-3b$).
Misconception: A bare variable term is not counted when combining like terms, so its contribution is dropped.

13. Solve: $8m-5=3m+15$

13. $m=4$ Likely wrong answer: $m=-4$ (subtracts $8m$ from both sides instead of $3m$).
Misconception: The smaller variable term is not the one chosen to eliminate, leading to a sign error.

14. Determine the number of solutions: $4q-3=4q+9$

14. No solution Likely wrong answer: Infinitely many solutions (mistakes a false statement for a true one). Misconception: A contradiction (unequal constants) is read as a true statement rather than as no solution.

15. A number is multiplied by 6 and then increased by 4. The result is 40. Write and solve an equation.

15. $6n+4=40$, so $n=6$ Likely wrong answer: $6(n+4)=40$, so $n \approx 2.67$ (writes 'increased by' as if it applies before the multiplication). Misconception: The order of the two described operations is reversed when building the equation.

Worksheet B: Independent Practice

1. Solve: $3(x-4)=27$

1. $x=13$ Likely wrong answer: $x=5$ (distributes 3 across only the x , not the 4).

Misconception: The multiplier is not distributed to every term inside the bracket.

2. A gym charges a \$25 joining fee and \$15 per month. A member paid \$115. Write and solve an equation for the number of months.

2. $15m+25=115$, so $m=6$ months Likely wrong answer: $15m+25=115$ solved as $m=90/15$ with the wrong constant moved, or $25m+15=115$. Misconception: The flat fee and per-month rate are assigned to the wrong parts of the equation.

3. Solve: $-4(y+2)=16$

3. $y=-6$ Likely wrong answer: $y=2$ (drops the negative sign when dividing by -4).

Misconception: The negative coefficient's sign is not carried through the final division.

4. Solve: $6x-7=4x+9$

4. $x=8$ Likely wrong answer: $x=-8$ (subtracts $6x$ from both sides instead of $4x$).

Misconception: The smaller variable term is not the one chosen to eliminate, leading to a sign error.

5. A car rental costs \$35 for one day plus \$0.25 per kilometre. A customer pays \$72. Write and solve an equation for the number of kilometres travelled.

5. $0.25k+35=72$, so $k=148$ km Likely wrong answer: $35k+0.25=72$ (assigns the flat fee and rate to the wrong terms). Misconception: The flat fee and per-kilometre rate are assigned to the wrong parts of the equation.

6. Solve: $12-3m=-6$

6. $m=6$ Likely wrong answer: $m=-6$ (drops the negative sign when dividing by -3).

Misconception: The negative coefficient's sign is not carried through the final division.

7. Solve: $2(3a+1)=20$

7. $a=3$ Likely wrong answer: $a=6$ (distributes 2 across only $3a$, not the 1). Misconception: The multiplier is not distributed to every term inside the bracket.

8. Solve: $7r-3+2r=33$

8. $r=4$ Likely wrong answer: $r=4.5$ (miscombines $7r$ and $2r$ as $9r$ but mishandles the constant sign). Misconception: Like terms are combined correctly but the constant's sign is dropped.

9. Solve: $3m+14=5m-2$

9. $m=8$ Likely wrong answer: $m=-8$ (subtracts $5m$ from both sides instead of $3m$). Misconception: The smaller variable term is not the one chosen to eliminate, leading to a sign error.

10. Determine the number of solutions: $9p-4=9p-4$

10. Infinitely many solutions Likely wrong answer: No solution (mistakes a true statement for a false one). Misconception: A statement that is always true is read as a contradiction rather than as infinitely many solutions.

11. The perimeter of a rectangle is 54 cm. The length is 5 cm more than the width. Write and solve an equation for the width.

11. Width = 11 cm; length = 16 cm Likely wrong answer: width=13.5 (adds 5 into the perimeter formula incorrectly). Misconception: The relationship between length and width is not carried correctly into the perimeter equation.

12. Solve: $5x+8=33$

12. $x=5$ Likely wrong answer: $x=8.2$ (subtracts 8 before dividing by 5, in the wrong order). Misconception: The operations are undone in the order they were applied instead of reverse order.

13. Solve: $-2p+7=19$

13. $p=-6$ Likely wrong answer: $p=6$ (drops the negative sign when dividing by -2). Misconception: The negative coefficient's sign is not carried through the final division.

14. Solve: $n\div5-4=3$

14. $n=35$ Likely wrong answer: $n=-5$ (multiplies by 5 before adding 4, in the wrong order). Misconception: The operations are undone in the order they were applied instead of reverse order.

15. Solve: $5-2(2b-3)=17$

15. $b = -3/2$ Likely wrong answer: $b = -6$ (distributes the -2 incorrectly, only to the first term inside the bracket). Misconception: The multiplier is not distributed to every term inside the bracket.

16. Solve: $4s + 9 - 6s = 21$

16. $s = -6$ Likely wrong answer: $s = 6$ (combines $4s$ and $-6s$ as $2s$ instead of $-2s$). Misconception: Unlike-signed coefficients are combined by adding magnitudes instead of their signed values.

17. Solve: $8 - 2n = 4n - 10$

17. $n = 3$ Likely wrong answer: $n = -3$ (adds $2n$ to both sides instead of subtracting, or a sign slip moving terms). Misconception: A term is moved to the other side of the equation without flipping its sign.

18. Determine the number of solutions: $2q + 11 = 2q - 1$

18. No solution Likely wrong answer: Infinitely many solutions (mistakes a false statement for a true one). Misconception: A contradiction (unequal constants) is read as a true statement rather than as no solution.

19. Two consecutive integers have a sum of 31. Write and solve an equation for the smaller integer.

19. Smaller integer = 15; next integer = 16 Likely wrong answer: $n + (n + 1) = 31$ solved as $n = 30$ (forgets to combine the two n -terms before solving). Misconception: Two like terms representing consecutive integers are not combined before isolating the variable.

20. A student solves $2(x - 5) = 18$ as follows: $x - 5 = 9$; $x = 14$. Is the student's method valid? Explain why or why not. Then check the solution in the original equation.

20. Valid. Divide by 2 first, then add 5. $x = 14$. Check: $2(14 - 5) = 18$. Likely wrong answer: valid, $x = 14$. Misconception: (this item asks the student to evaluate a valid method; the check confirms $2(9) = 18$)

Worksheet C: Mixed Application

1. A taxi charges \$4 to start and \$2.50 per kilometre. The total fare is \$29. Write and solve an equation for the number of kilometres travelled.

1. $2.50k+4=29$, so $k=10$ km Likely wrong answer: $4k+2.50=29$ (assigns the flat fee and rate to the wrong terms). Misconception: The flat fee and per-kilometre rate are assigned to the wrong parts of the equation.

2. Solve and check: $5(2m-1)=35$

2. $m=4$ Likely wrong answer: $m=3.5$ (distributes 5 across only $2m$, not the -1).
Misconception: The multiplier is not distributed to every term inside the bracket.

3. Solve and check: $2b+11=5b-7$

3. $b=6$ Likely wrong answer: $b=-6$ (subtracts $5b$ from both sides instead of $2b$, mishandling the sign). Misconception: The smaller variable term is not the one chosen to eliminate, leading to a sign error.

4. Determine the number of solutions: $3x+10=3x+10$

4. Infinitely many solutions Likely wrong answer: No solution (mistakes a true statement for a false one). Misconception: A statement that is always true is read as a contradiction rather than as infinitely many solutions.

5. A streaming service charges a \$12 monthly fee plus \$3 for each movie rental. A customer's bill is \$30. Write and solve an equation for the number of rentals.

5. $3r+12=30$, so $r=6$ rentals Likely wrong answer: $12r+3=30$ (assigns the flat fee and rate to the wrong terms). Misconception: The flat fee and per-rental rate are assigned to the wrong parts of the equation.

6. Solve and check: $4x-9=27$

6. $x=9$ Likely wrong answer: $x=4.5$ (adds 9 instead of subtracting, in reverse order).
Misconception: The operations are undone in the order they were applied instead of reverse order.

7. Solve and check: $y\div 3+7=12$

7. $y=15$ Likely wrong answer: $y=15$ miscomputed as $y=36$ (multiplies by 3 before subtracting 7 in the wrong order). Misconception: The operations are undone in the order they were applied instead of reverse order.

8. Solve and check: $7-3(n+2)=-14$

8. $n=5$ Likely wrong answer: $n=-2$ (distributes -3 across only n , not the 2, or mishandles the leading 7). Misconception: The multiplier is not distributed to every term inside the bracket.

9. Solve and check: $6a-4+3a=32$

9. $a=4$ Likely wrong answer: $a=4$ miscomputed with $6a$ and $3a$ combined incorrectly as $3a$. Misconception: Like terms with the same sign are combined by subtracting instead of adding their coefficients.

10. Solve and check: $4p-6=2p+18$

10. $p=12$ Likely wrong answer: $p=-12$ (subtracts $4p$ from both sides instead of $2p$, mishandling the sign). Misconception: The smaller variable term is not the one chosen to eliminate, leading to a sign error.

11. Determine the number of solutions: $5m-8=5m+1$

11. No solution Likely wrong answer: Infinitely many solutions (mistakes a false statement for a true one). Misconception: A contradiction (unequal constants) is read as a true statement rather than as no solution.

12. A rectangle has a length that is 4 cm more than its width. The perimeter is 40 cm. Find the width and length.

12. Width = 8 cm; length = 12 cm Likely wrong answer: width=9 cm (adds 4 into the perimeter formula incorrectly). Misconception: The relationship between length and width is not carried correctly into the perimeter equation.

13. A student solves $3x+4=22$ and writes $3x=26$. Identify the error and solve correctly.

13. The student added 4 instead of subtracting it. $3x=18$, so $x=6$. Likely wrong answer: (already given) $3x=26$. Misconception: The constant term is added instead of subtracted when isolating the variable term.

14. Non-Routine: A student says that the equation $4(x-2)=4x-8$ has no solution because the left side has brackets and the right side does not. Is the student correct? Explain what the equation becomes after simplifying. Then determine how many solutions it has.

14. Correct answer: The student is not correct. Distribute 4: $4(x-2)=4x-8$. The equation becomes $4x-8=4x-8$. Subtract $4x$ from both sides: $-8=-8$. The equation has infinitely many solutions. Likely wrong answer: No solution. Misconception: The student may think two expressions must look identical before they can represent the same value. Next move: Expand the bracketed expression before comparing both sides.

15. Non-Routine: A student solves $3(x-2)+2x=19$ as follows: $3x-6+2x=19$, $5x-6=19$, $5x=25$, $x=5$. Is the student correct? Check the solution in the original equation. If the solution is correct, explain why the sequence works. If it is not correct, identify the first incorrect step and solve correctly.

15. Correct answer: The student is correct. Distribute: $3x-6+2x=19$. Combine like terms: $5x-6=19$. Add 6: $5x=25$. Divide by 5: $x=5$. Check: $3(5-2)+2(5)=9+10=19$. Likely wrong answer: The student is wrong because $3x-6+2x$ cannot be simplified. Misconception: The student may not recognize that $3x$ and $2x$ are like terms after distribution. Next move: Rehearse the sequence: distribute, scan for like terms, simplify, then solve and check.

Answer Key — Exit Ticket

1. $x=6$
2. $y=6$
3. Infinitely many solutions

Worksheet 1: Guided Practice

1. $n=5$
2. $k=-4$
3. $m=12$
4. $x=4$
5. $a=3$
6. $x=4$
7. Infinitely many solutions
8. $x=6$
9. $r=4$
10. $s=-28$
11. $y=8$
12. $b=-5$
13. $m=4$

- 14. No solution
- 15. $6n+4=40$, so $n=6$

Worksheet 2: Independent Practice

- 1. $x=13$
- 2. $15m+25=115$, so $m=6$ months
- 3. $y=-6$
- 4. $x=8$
- 5. $0.25k+35=72$, so $k=148$ km
- 6. $m=6$
- 7. $a=3$
- 8. $r=4$
- 9. $m=8$
- 10. Infinitely many solutions
- 11. Width = 11 cm; length = 16 cm
- 12. $x=5$
- 13. $p=-6$
- 14. $n=35$
- 15. $b=-3/2$
- 16. $s=-6$
- 17. $n=3$
- 18. No solution
- 19. Smaller integer = 15; next integer = 16
- 20. Valid. Divide by 2 first, then add 5. $x=14$. Check: $2(14-5)=18$.

Worksheet 3: Mixed Practice & Application

Item 14 (Non-Routine)

Correct answer: The student is not correct. Distribute 4: $4(x-2)=4x-8$. The equation becomes $4x-8=4x-8$. Subtract $4x$ from both sides: $-8=-8$. The equation has infinitely many solutions.

Likely wrong answer: No solution.

Misconception: The student may think two expressions must look identical before they can represent the same value.

Next move: Expand the bracketed expression before comparing both sides.

Item 15 (Non-Routine)

Correct answer: The student is correct. Distribute: $3x-6+2x=19$. Combine like terms: $5x-6=19$. Add 6: $5x=25$. Divide by 5: $x=5$. Check: $3(5-2)+2(5)=9+10=19$.

Likely wrong answer: The student is wrong because $3x-6+2x$ cannot be simplified.

Misconception: The student may not recognize that $3x$ and $2x$ are like terms after distribution.

Next move: Rehearse the sequence: distribute, scan for like terms, simplify, then solve and check.

1. $2.50k+4=29$, so $k=10$ km
2. $m=4$
3. $b=6$
4. Infinitely many solutions
5. $3r+12=30$, so $r=6$ rentals
6. $x=9$
7. $y=15$
8. $n=5$
9. $a=4$
10. $p=12$
11. No solution
12. Width = 8 cm; length = 12 cm
13. The student added 4 instead of subtracting it. $3x=18$, so $x=6$.
14. (see diagnostic above)
15. (see diagnostic above)